

# **DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA**

By

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## DECLARATION

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# **ABSTRACT**

## **Background**

The potential of social media to improve health communication and health information sharing between clinicians in emergency care in low-resource settings (LRS) cannot be underestimated. Social media, including mobile applications and online websites, is already informally used in LRS to provide real-time clinical support to emergency care providers, who might otherwise lack adequate training or access to information. It is unlikely that this practice can be stopped, despite valid concerns based largely on legality and privacy, and existing evidence suggests that the benefits to its use outweigh associated risks. It is likely that contextually appropriate guidance on the application of social media to healthcare would yield safer use; this would be especially impactful in LRS, where there is anecdotal evidence of uncontrolled use of social media as a point-of-care telemedicine tool in emergency care.

To do this, its scope of use must be better understood, but no study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa. There is a need for in-depth investigation into the currently undocumented use of social media for point-of-care telemedicine throughout Africa. Such a study will provide insight into how clinicians are obtaining clinical insight from other providers and allow for the development of guidance on safe social media use in healthcare knowledge sharing and seeking.

## **Aim and objectives**

This PhD aimed to describe the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa. It had the following objectives:

1. With regard to the use of social media platforms for real-time clinical consultation by emergency care practitioners:
  - a. Identify what social media platforms are currently being used in emergency care,
  - b. Evaluate the potential impacts of social media use on patient outcomes,
  - c. Describe the risks and benefits associated with social media use in this setting, and
  - d. Identify facilitators and barriers for social media use.
2. Identify gaps in the literature on the relationship between the use of social media and efficacy of clinical care in EUs.

## **Methods**

A scoping review was conducted to map the available literature on the use, results, benefits and risks associated with social media applications as a point-of-care platform. Following this, a sequential quantitative-qualitative mixed methods approach was taken to describe the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa. First, a self-reported, cross-sectional survey describing the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care telemedicine tool was administered to African emergency care practitioners. Finally, in study three, semi-structured interviews were conducted to gain an understanding of African clinicians' views, attitudes, and behaviours towards social media use to enhance bedside emergency care.

## **Results**

A scoping review identified 13 publications that describe the use and/or perceptions surrounding use of social media as a point-of-care tool in emergency medical settings.

WhatsApp, a free messaging service, was the platform of interest in all of these studies, and no studies were located in low- or lower-middle-income countries. All studies evaluated the use of WhatsApp as a real-time consultation method, and those that assessed reliability found it to be highly reliable for consultations using both images and written messages.

A total of 70 emergency care providers working in facility-based settings in Africa responded to the online cross-sectional survey; nearly all of these participants (n=68, 97.1%) worked in low- or lower-middle-income countries. Their responses made it clear that most clinicians use social media multiple times each day, and that the purposes vary: In some instances, it may be used to communicate advice, and in others, to receive it. An overwhelming majority felt that social media is positively impacting both the patient and provider experiences, and that it is simultaneously improving speed and safety.

Finally, eight African emergency care providers were interviewed to gain an in-depth understanding of how social media use impacts their provision of emergency care. All participants noted that they routinely use social media for a range of professional purposes, including consultations, administrative tasks and logistics, and education. Concerns about social media use for clinical purposes were also mentioned by all participants, including legality, privacy of data, and lack of employer regulations. Only one participant noted that their institution had a policy regarding deidentification of patient data when sharing on social media, and all expressed interest in formal guidelines for clinical social media use.

## **Conclusions and relevance**

The findings of this study provide insight into social media use of African emergency care physicians, suggesting that social media use in this group is ubiquitous. It is clear that

most clinicians use social media multiple times each day for a range of point-of-care purposes, and many feel that social media is positively impacting both the patient and provider experiences. It is perhaps unsurprising that social media has taken off with such vigour in African emergency care, a setting wherein specialty training remains limited, and a group of relatively young practitioners is geographically spread across a large region. Organisations seeking to further improve emergency care provisions on the continent should consider social media as a key method to reach these providers and should focus their efforts particularly on WhatsApp and Instagram platforms. Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

## **ACKNOWLEDGEMENTS**

It is my great pleasure to acknowledge and thank all those who supported me during this long journey of writing this dissertation, which was hampered by many factors including the COVID-19 pandemic. There were times when I thought of giving up; however, my family and friends lent me a strong hand and great support to keep me going and to reach my goal of completing this dissertation. The work could not have been accomplished without the encouragement, support, and guidance of Professor Lee Wallis, to whom I am greatly indebted; his immense help and support is beyond any measure. I am also grateful to Associate Professor Stevan Bruijns and Professor Hayfaa Wahabi for their direction and assistance. A special thank you to Dr Colleen Saunders for assisting me in getting this dissertation to the finish line.

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## **ABBREVIATIONS**

<b>ACEP</b>	American College of Emergency Physicians
<b>AFEM</b>	African Federation for Emergency Medicine
<b>CORD</b>	Council of Residency Directors
<b>CT</b>	Computed Tomography
<b>DALY</b>	Disability-Adjusted Life Year
<b>DCP</b>	Disease Control Priorities
<b>ECG</b>	Electrocardiogram
<b>ECS</b>	Emergency Care System
<b>EHR</b>	Electronic Health Record
<b>EMS</b>	Emergency Medical Services
<b>EU</b>	Emergency Unit
<b>FOAMed</b>	Free Open Access Medical Education
<b>GDP</b>	Gross Domestic Product
<b>HIC</b>	High-Income Country
<b>HIPAA</b>	Health Insurance Portability and Accountability Act
<b>HREC</b>	Human Research Ethics Committee
<b>IFEM</b>	International Federation for Emergency Medicine
<b>IQR</b>	Interquartile Range
<b>SMS</b>	Short Message Service
<b>LIC</b>	Low-Income Country
<b>LMICs</b>	Low- and Middle-Income Countries
<b>LRS</b>	Low-Resource Setting
<b>PACS</b>	Picture Archiving and Communication System
<b>PHI</b>	Patient Health Information

**PRISMA** Preferred Reporting Items for Systematic Reviews and Meta-Analyses

**PRISMA-ScR** Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Extension for Scoping Reviews

**SD** Standard Deviation

**STEMI** ST-Elevated Myocardial Infarction

**SMS** Short Message Service

**UHC** Universal Health Coverage



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# Chapter 1: Introduction

## 1.1 Social Media

Social media (noun): *“Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time.”*<sup>1 2</sup>

### 1.1.1 The advent of social media

Following the invention of the internet in 1983,<sup>3</sup> simple messaging between computers became feasible.<sup>4</sup> “Instant messaging” was the precursor to social media, which allowed users send direct messages electronically between computers via the internet.<sup>4</sup> Soon after, “chat rooms,” which are communication spaces oriented around particular topics, came online.<sup>5 6</sup> Around the same time, in 1985, early wireless mobile phones were being used to make phone calls,<sup>7</sup> and the concept for “short message service” (SMS) texting was invented. Text messaging did not come of age until the early 1990’s, when mobile phone lines and devices were better equipped to support such messaging.<sup>8</sup>

Two decades after the invention of the internet, a concept called “social media” was introduced to the world, with a website called Six Degrees that allowed users to establish a social profile and connect with other users.<sup>9</sup> A similar website, MySpace, came online in 2003, and became the first social media site to have over one million active users a year later in 2004.<sup>4 9</sup> In the coming years, social media would come to be defined by three core features: 1) profiles for individual users, 2) interfaces that allowed for continuous uploading of content onto the platform by individual users, and 3) the ability to connect with other users in the form of discussion.<sup>9</sup> Social media quickly impacted all

facets of a modernising world. No longer did the general public have to rely on slower means of transfer, such as letters, newspapers, and television broadcasts, to receive important news and information; anyone with a computer and internet connectivity could quickly hear about personal and global news on social media.<sup>10 11</sup>

### **1.1.2 Social media applications**

Techopedia defines mobile applications as, “A mobile application, most commonly referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer.”<sup>12</sup> A number of mobile applications and websites are being leveraged to communicate and socialise in real-time online, as social media.<sup>13</sup> These applications are typically free to download and use, and are funded by advertising.<sup>14</sup> Central to nearly all of these sites is a unbroken feed of information and content, which keeps users engaged continuously.<sup>13</sup>

An overview of commonly used social media applications is below. Several are used primary for messaging, including WhatsApp, Facebook Messenger, and Telegram. Others are used for video sharing (YouTube) and general content sharing (Twitter). Finally, one popular application is used for professional development, including in the healthcare field (LinikedIn). All of the platforms mentioned are used primarily on mobile applications, though most can also be accessed through websites. Importantly to note is that many of these applications are owned and operated by the same companies, which are mostly American. For example, Meta Platforms, Inc. owns Facebook, Facebook Messenger, WhatsApp, and Instagram.<sup>15</sup>

In 2022, Facebook was the most commonly used social media platform both worldwide and in Africa, followed by YouTube, WhatsApp, Instagram, and Twitter.<sup>16 17</sup> Below, overviews are provided of these and other commonly used and potentially relevant applications.

Founded in 2004, Facebook is one of the earliest social media platforms, and the most successful.<sup>1812</sup> Facebook allows users to create a profile, with a photo and information about themselves; unique to this profile is a “Timeline” on which users can post content and engage in commentary with “Friends” that they are connected to on the platform.<sup>18</sup> Facebook also has a “News Feed” that allows users to see the content that is posted by their friends in a single, continuous feed.<sup>18</sup> Although the platform was originally available only to American college students, it quickly grew beyond that group.

The online “microblogging” platform Twitter is unique in the way it allows for content to be shared: All communications – known as “tweets” – must be 280 characters or fewer. Established in 2004, its purpose is to facilitate global public conversations and engage communities in discussions around topics of interest.<sup>19</sup> Communications are shared by users with their “followers,” who see their tweets in a continuous newsfeed.<sup>20</sup> Each day, 500 million tweets are shared, with nearly 250 million users engaging on the platform.<sup>21</sup>

YouTube was founded shortly after, in 2005, as a means of sharing personal videos.<sup>22</sup> It is now the largest online video streaming service, home to over 800 million unique videos, on a range of personal, educational, and promotional topics.<sup>22 23</sup> Worldwide, users watch a total of more than five billion YouTube videos each day.<sup>23</sup> Users participate by uploading

or viewing content. In recent years, the company has expanded the social engagement component of its platform, with features such as commenting on and “liking” content.

WhatsApp, a messaging application that is considered “low-bandwidth” – i.e., it requires minimal cellular or wireless internet service – was developed in 2009.<sup>24</sup> By 2016, WhatsApp had one billion daily users,<sup>25</sup> and the platform reached two billion daily users by 2020.<sup>26</sup> It is now ranked as the most-used messaging platform, with over one billion messages sent each day thus far in 2022.<sup>26</sup> Given the application’s ability to function in areas with lesser access to mobile data, WhatsApp’s presence is larger in LMICs than in HICs.<sup>27</sup>

Instagram is a photo- and video-sharing application created in 2010.<sup>28</sup> Similar to other social media sites, it involves sharing content to “followers” who choose to see a user’s content in their feed. Instagram has a newer feature called “stories” that allows users to post short video clips that expire after 24 hours.<sup>29</sup> The site has more than 1.25 billion monthly users.<sup>30</sup>

Facebook Messenger has 1.3 billion active users in 2022 and was the second most-downloaded mobile application worldwide from its launch in 2010 to 2020.<sup>9 31 32</sup> The platform functions as a standalone application but is heavily integrated into the Facebook ecosystem: In order to use Facebook Messenger, users must already have an established profile on the broader Facebook platform.

Although less popular worldwide, Telegram is a commonly used cloud-based social media messaging application in LRS.<sup>33</sup> It has a rapidly growing user base, which now

exceeds 700 million daily users. Unlike WhatsApp and Facebook Messenger, the platform offers both free and premium messaging, with those paying a subscription receiving additional features.<sup>33</sup>

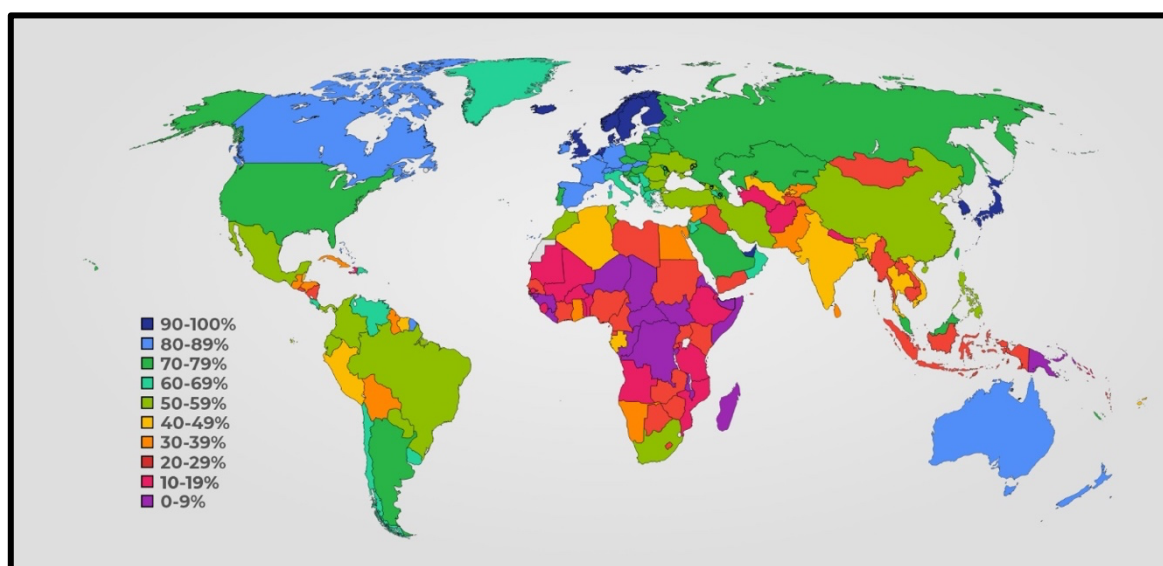
LinkedIn, which considers itself “the world’s largest professional network,” is a social media platform devoted to creating and maintaining professional connections.<sup>34</sup> The site has over 800 million users in more than 200 countries and is extremely popular those with college educations.<sup>35</sup> Users primarily leverage the site to connect with others in their professional fields, access education, and identify and apply for new positions.<sup>35</sup>

### **1.1.3 Barriers to social media use in low- and middle-income countries**

Access to smartphones and internet connectivity are requisites for social media use. It is important to note that the dawn of both social media and smartphone use was not equal worldwide. The majority of the world – 84% - lives in a region with access to mobile data connectivity.<sup>36</sup> Speeds do, however, vary. Internet coverage is generally lower in LMICs compared to HICs, and it is lowest in sub-Saharan Africa (Figure 1.1).<sup>37</sup> In 2021, it has been noted that many people in LMICs experience slower internet speeds at higher costs.<sup>38</sup>



**Figure 1.1:** Internet penetration rate by country<sup>39</sup>



Despite the ubiquity of the internet and mobile data connectivity in many regions of the world, as of 2022, only five billion people – 63.1% of the world’s population – are users of the internet.<sup>40</sup> As of 2022, only 54% of the population in LMIC uses the internet; this value is significantly lower at 21% in LICs.<sup>37</sup> In contrast, 90% of people living in HICs are considered active internet users.<sup>37</sup> The saturation of internet use in HICs has led to a plateau in growth of new users, and use is rising faster in LICs than any other country level.<sup>37</sup>

Nearly all five billions users of the internet – 4.7 million of them – use social media.<sup>40</sup> The COVID-19 pandemic solidified its importance in users’ lives, when lockdowns required a mass shift to online presence in nearly all facets of daily life.<sup>41</sup> Social media platforms became channels of communication for both personal and professional needs during this time.<sup>42</sup> These applications were essential to protecting physical and mental health, communicating with loved ones and co-workers alike, and obtaining real-time news about

the pandemic. The gap in internet accessibility for those in lower-income regions meant that they could not leverage social media as effectively for these purposes.<sup>43 44</sup>

#### **1.1.4 Social media in healthcare**

By 2011, it was being noted in the medical literature that access to a new generation of mobile phones – known as “smartphones” – was changing the landscape of healthcare.<sup>45</sup> These phones were built upon original mobile phones, but had more advanced data features and full keyboards.<sup>46</sup> Improved internet connectivity speeds accessible on these devices and broader data coverage across more of the world <sup>46</sup> allowed for healthcare providers to readily access information while on the job, without needing to get to a desktop computer. Furthermore, the full keyboards opened up opportunities to quickly communicate questions and information in short snippets, without the need for phone calls.<sup>45</sup> Unsurprisingly, availability of smartphones in the pockets of healthcare providers led to a surge in social media usage in medicine.

By 2013, social media had been introduced to healthcare, allowing for internet-based communication. Social media had begun nearly a decade earlier, taking place on a range of platforms, including websites, blogs, photo-sharing sites, and instant messenger.<sup>5</sup> But now, mobile “applications” – commonly referred to as “apps” – existed to provide isolated and specific services on smartphones.<sup>47</sup> Many of these apps were focused on social media, allowing people to connect and rapidly share ideas and information from the palms of their hands.<sup>48 49</sup>

Some of the first documentations of social media use in healthcare surround direct patient care.<sup>45</sup> For example, the use of at-home wearable health sensors (such as heart rate

monitors or movement trackers) with data sent to healthcare providers' smartphones introduced novel methods of patient engagement and monitoring in the realm of chronic disease management.<sup>45</sup> But, what began as a method of objective data transfer quickly morphed into a means of communication, both between patients and providers, and amongst providers. To-date, countless peer-reviewed studies have been published documenting use cases for social media related to a range of health purposes, including public health information sharing,<sup>50 51</sup> patient-provider communications,<sup>52 53</sup> disease surveillance,<sup>54 55</sup> informing and recruiting for health research,<sup>56 57</sup> and healthcare provider training and professional development.<sup>49 58-60</sup>

The impacts of social media in healthcare are well-documented. High accessibility is likely driving a large part of this impact: Unlike electronic health records (EHR) platforms, social media applications tend to be available to the general public free of charge. Furthermore, use is increasing with each new generation, suggesting that the role of social media in healthcare will only continue to grow over time. Positive impacts are seen for both healthcare providers and their patients. For providers, benefits of social media include increased opportunities for digital communication with, and education of, patients; ongoing medical education; and real-time communication with peers.<sup>61</sup> Social media also opens the door to professional networking opportunities, aiding providers in identifying new roles or research collaborations.<sup>62</sup> These platforms allow for increased reach of recruitment efforts for research studies, which lends to stronger evidence to inform patient care.<sup>63</sup>

Social media is contributing to more equitable and effective healthcare for patients.<sup>64 65</sup> Patients experience more frequent communication with their healthcare providers and

can engage more easily in disease management and education programs. The increased accessibility to online health programs reduces the financial and logistical barriers to involvement and increases participation in hard-to-reach populations.<sup>64</sup> Social media also facilitates public discussion around a range of health conditions, reducing stigma related to these diseases.<sup>66</sup>

There is, however, risk inherent to using social media for healthcare purposes.<sup>67</sup> Healthcare encounters typically require patients to share vulnerable information, and national and international organisations have set forth clear guidelines on the privacy and protection of said health information.<sup>68 69</sup> Historically, health data was stored on paper-based records in a physically secured location, such as a locked filing cabinet in a medical office.<sup>70</sup> As technology has evolved, many regions have transitioned some or all of their recordkeeping to digital platforms, using purpose-designed electronic health records to maintain patient information.<sup>70</sup> When health data is shared beyond the walls of these routine data storage mechanisms, there are concerns for data breaches and misuse.<sup>67</sup> The use of social media to engage in healthcare-related information-sharing is particularly risky, as these platforms are not regulated by health-related institutions. Furthermore, there are few guidelines for providers and patients on how to appropriately engage in information-sharing outside of health records. Providers may not know exactly what data or images are considered confidential, and information may be shared without appropriate patient consent.<sup>71</sup>

Even when information is shared appropriately and securely, data breaches may lead to dissemination of patient data beyond the originally intended parties.<sup>71</sup> Social media applications, including messaging platforms, have been identified as the most common

platforms for hacking.<sup>72</sup> Reliability in access to information can also be an issue, as technological errors can leave platforms may be unavailable for periods of time. For example, in 2021, Facebook, which owns Facebook Messenger, Instagram, and WhatsApp, experienced a company-wide outage for nearly six hours.<sup>73</sup> During this time, no content could be accessed on any of the aforementioned platforms. If social media application is being used in real-time to inform urgent healthcare matters, outages pose huge risks to patient outcomes.

Social media use has also been studied quite extensively as it relates to the provision of medical care during emergency situations, such as natural disasters and disease outbreaks. In times of crisis, social media applications allow the general public to connect with sources of reliable knowledge, including healthcare providers and public health practitioners. With a single post on social media, healthcare bodies can provide general guidance to the masses, such as how to maintain health or when to seek medical care. Real-time information to the public can reduce the volume of people presenting to healthcare institutions for care or advice, thus reducing the burden on the healthcare system at-large. The COVID-19 pandemic has provided countless use cases for social media in times of disaster.

Misinformation is also a risk in these situations, as social media sites do not require verification that health information is factual.<sup>74 75</sup> The flow of inaccurate health information across social media platforms during the COVID-19 pandemic highlighted the lack of fact-checking on social media.<sup>75 76</sup> Users are able to post content, claiming it to be scientific evidence, and even cite themselves as experts, without any objective verification. This becomes particularly problematic when additional users share the content, spreading

misinformation further and leading broader populations to make poor health-related decisions.

## **1.2 Emergency care**

### **1.2.1 Emergency care**

Emergency medical conditions, defined as “*Illnesses, injuries, symptoms or conditions so serious that a reasonable person would seek care right away to avoid severe harm*”,<sup>77</sup> comprise nearly half of the total global burden of disease.<sup>78</sup> These conditions generate significant disability and premature death worldwide.<sup>78</sup> They also take serious social and economic tolls on vulnerable populations: For example, because most victims of traumatic injuries are between the ages of 15 and 44 years old, death and disability in this group reduces productivity.<sup>79</sup>

Advances in the provision of emergency care worldwide have reduced the impacts of emergency medical conditions in higher-income countries,<sup>80 81</sup> and the current burden of emergency conditions disproportionately affects the lowest income countries: More than 90% of all injury-related deaths occur in low-income countries (LICs).<sup>82</sup> In terms of disability-adjusted life years (DALYs), emergency conditions are nearly 60% worse in low-resource settings (LRS), which experience a burden of 25,186 DALYs per 100,000 population – nearly double the 15,691 DALYs seen per 100,000 in middle-income countries.<sup>80 81</sup> Part of this trend is due to the rapid urbanisation and increasing access to motorised vehicles and weapons in LRS, and also the growth of non-communicable diseases such as hypertension, diabetes, and cardiac conditions that can lead to emergencies such as cardiac arrest and stroke—all of which are likely to increase in LRS in the coming decades. Despite the prevalence of emergency conditions and the

consequential negative health and economic impact though, most LRS lack relevant emergency care policies and capacities.

Growing evidence suggests an important role for emergency care in accelerating progress on global health priorities and narrowing health disparities.<sup>83-88</sup> While, historically, much of this research has been conducted in high-income countries (HICs) with established emergency care systems,<sup>88</sup> more recent efforts have homed in on the specific impacts of emergency care in low- and middle-income countries (LMICs). The World Bank's Disease Control Priorities (DCP) project estimates that of the 45 million deaths per year in LMICs, 54% are due to conditions that are potentially addressable through prehospital and/ or emergency unit (EU) care.<sup>83</sup> This translates to a staggering 932 million years of life lost to premature mortality and over a million disability-adjusted life years.<sup>83</sup> However, this burden can be lessened by effective and well-timed emergency care. A strong body of research clearly demonstrates that organised emergency care systems (ECSs) can lead to significant reductions in morbidity and mortality.<sup>89 90</sup> Additional literature has shown that many of the most prominent causes of death and disability in LMICs, including ischaemic heart disease, road traffic injuries, respiratory infections, and diarrhoea have been responsive to improvements in emergency care delivery.<sup>91</sup> Despite this, emergency care has remained virtually absent from the global health agenda, as most initiatives – particularly in LRS - have emphasised prevention, primary care, and vertical approaches to disease control.<sup>87</sup>

### **1.2.2 Social media in emergency care**

The internet is a powerful tool for education and for information sharing, and internet penetration rates and connection speed throughout Africa have seen dramatic increases

recent decades. The continent's internet penetration rate, which was 42.2% in June 2020, has seen a 12,441% increase between 2000 and 2020.<sup>92</sup> Despite these improvements, compared to the rest of the world, internet usage rates are well below average: The global average penetration rate is approximately 62.0%, with high-income countries (HICs) reaching well above 90%.<sup>92 93</sup> Many African countries – particularly the lowest-income and those in conflict areas – have very low overall internet access and poor internet infrastructure.<sup>92 93</sup> Interestingly, those African countries that are experiencing growth in broadband and mobile technology in particular appear to roughly correlate with the list of countries with active growth of emergency care systems and functionality. Botswana, Egypt, Ethiopia, Ghana, Mozambique, Rwanda, South Africa, Sudan, Ethiopia, Tanzania, Uganda, and Zimbabwe are currently the only countries out of 52 with established emergency care training programmes for specialist physicians; other countries only have non-specialist offerings.<sup>94</sup> South Africa has both the most developed emergency care systems on the continent, and one of the highest broadband and mobile internet usage rates.<sup>92 93 95</sup>

With growth in internet use in general comes marked growth in the popularity of social media sites and applications, both worldwide and in Africa. The number of Facebook users in Africa was estimated at approximately 213 million individuals in 2020, up 64.5% since 2015 <sup>96</sup>. Nearly the same number – 192 million – are noted to use Africa's most popular messaging app, WhatsApp.<sup>97</sup> Many of these sites and applications are commonly used around the world by healthcare practitioners and students.<sup>98</sup> In HICs, the use of social media by facility-based clinicians to inform healthcare decision-making has been well-documented.<sup>98 99-101</sup> Clinicians report using social media in a range of ways, include finding and exchanging information, directly communicating or networking with



colleagues, disseminating research findings, participating in health advocacy, and marketing a product or practice.<sup>98 101</sup> In addition, some use social media to directly interact with patients or to gather patients' personal information when traditional sources of information are exhausted. For example, a study of paediatric faculty and trainees in the United States found that between 14% and 18% of trainees had conducted an internet or social media search for information about a patient, and 14% of faculty stated they would use the internet to determine necessary additional patient information.<sup>102</sup> A 2009 study describing the effect of social media internet tools on junior physicians' daily clinical practice reports Google and Wikipedia use by 80% and 70% of physicians, respectively.<sup>103</sup> A 2013 systematic review identified six key overarching benefits of social media use in a clinical setting: increased interactions with others, more available, shared and tailored information, increased accessibility and widening access to health information, peer/social/emotional support, public health surveillance, and the potential to influence health policy.<sup>104</sup> In the context of the COVID-19 pandemic, healthcare-related social media use has skyrocketed: Providers are leveraging social media to disseminate critical information and connect with those in need of care.<sup>105</sup>

Physicians' use of social networking as a tool to crowdsource answers to clinical questions has been of particular interest, as it has the potential to enhance real-time clinical care in settings where other sources of information are limited or unavailable. Two examples of this application in the United States healthcare system are Sermo ([www.sermo.com](http://www.sermo.com)) and Doximity ([www.doximity.com](http://www.doximity.com)).<sup>106</sup> Sermo is an online social networking community where "physicians across all 50 states in the US representing 68 specialties come to network, discuss treatment options, and curb side peers for expert advice whenever they need it."<sup>106</sup> Doximity, a newer physician-only social networking

community, allows users to search a database of healthcare providers, and supports point-of-care crowdsourcing via Health Insurance Portability and Accountability Act (HIPAA)-compliant messaging within this database.<sup>106</sup>

The potential benefits of social media in clinical practice are ample and have been described in observational studies in some settings; however, there are limitations and risks inherent to this type of information sharing and seeking that have not been studied in-depth.<sup>98 101-104</sup> Numerous institutional statements and practical guidelines have emerged as the social media landscape has developed, and many studies on social media use in healthcare include best practice recommendations.<sup>98 107-112</sup> A 2012 review of social media use by clinicians found that two types of risk are prevalent and thus of major concern: breaches of patient confidentiality and publication of unprofessional content.<sup>113</sup> Other issues with healthcare-related social media used include high levels of low-quality information and lack of quality oversight, licensing issues, liability, and legal grey areas stemming from the rapid emergence and evolution of social media use. Use of social media tools for physician education in emergency care is under-reported. One study of the integration of social media into emergency medicine residency curricula surveyed 226 residents across 12 different US residency programs and found that 98% used some sort of social media learning at least one hour per week.<sup>114</sup> However, the types of modalities described are limited to blogs, podcasts, and video casts, none of which are of much particular use in real-time clinical care. Other literature on social media use in emergency care is sparse, particularly for one-on-one communication with other professionals or point-of-care information-seeking.

Social media use could have value in LRS as a point-of-care tool, especially in LRS where health education infrastructure cannot provide the level of support, mentorship, and information required to maintain clinical best practices. Indeed, there is strong anecdotal evidence in the African emergency care community that suggests it is already used extensively for these purposes within African EUs. However, an educated understanding of the prevalence of use, and the benefits and risks of social media use to inform frontline clinical emergency care in real-time lacks in this setting.

Note that, for the purpose of this PhD, social media is being evaluated in the context of its utility as a real-time point-of-care tool. Countless definitions exist for social media, some more restrictive than others. Given the novelty of social media and the likely limited scientific literature exploring its use in LRS, this dissertation will use to an extremely broad – but widely accepted - definition. A range of platforms may serve this function, including those that support instant messaging (e.g., WhatsApp, Facebook Messenger, and Telegram) as well as others that allow for the posting of text and multimedia in forums (e.g., Facebook).<sup>115</sup> The following definition of social media will be adhered to throughout this work: *“Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time.”*<sup>1 2</sup> In some instances, social media applications may be fully public, while in other instances – such as private Facebook or WhatsApp groups, content may be restricted to a smaller audience.

### **1.3 Motivation**

Social media plays a powerful role in our world and, by extension, in modern healthcare. Social media is leveraged for nearly all aspects of medical training and provision of care,

including educational materials and real-time consultations via text, phone call, or video conferencing. The potential of social media to improve health communication and health information sharing in emergency care in LRS cannot be underestimated. Social media, including its mobile applications, is already informally used in LRS to provide real-time clinical support to emergency care providers, who otherwise lack adequate training or access to information. There are numerous benefits to social media use in this setting, as it allows for more appropriate and effective care to be provided at a lower cost. Several concerns do exist surrounding the use of social media in healthcare, including patient privacy, inappropriate use, and risks of loss of information (for example, if a communication device such as a phone is lost). The accuracy of social media content is also a concern, as many sources include non-verified information, and the credentials and primary sources of information may not be authenticated. Healthcare providers are traditionally taught to interrogate and confirm sources; however, this can be challenging to accomplish in time-restricted emergency care settings. It is unlikely that the practice of social media use for point-of-care interventions can be halted, despite arguably valid concerns based largely on legality and ethics, and existing evidence suggests that the clinical benefits to its use outweigh associated risks.<sup>113</sup>

Contextually appropriate guidance on the application of social media to healthcare could yield safer use; this would be especially impactful in LRS, where there is strong, anecdotal evidence of uncontrolled use of social media as a point-of-care tool in emergency care.

In order to do this, its scope of use must be better understood. A 2021 scoping review of social media use for any purpose related to healthcare found 544 articles globally, of which only 24 (4.2%) stemmed from LMICs.<sup>49</sup> No study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa.

There is a need for in-depth investigation into the currently undocumented use of social media for point-of-care throughout Africa. Such a study will provide insight into how clinicians are accessing clinical information that is not locally available but considered important for acute care and allow for the development of guidance on safe and effective social media for use in healthcare knowledge sharing and seeking.

## **1.4 Aim and objectives**

### **1.4.1 Aim**

This PhD aims to describe the use of social media as a point-of-care tool in facility-based emergency care in Africa.

### **1.4.2 Objectives**

To achieve this aim, the following objectives were defined:

1. To describe, through a scoping review, the use, benefits and risks pertaining to the use of social media as a point-of-care tool for emergency care globally (study one)
2. To describe, through a survey, the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care tool by emergency care providers in Africa (study two)
3. To describe, through interviews, the perception of the risks and benefits, and barriers and facilitators, and intention-to-use of social media as a point-of-care tool for emergency care (study three)

Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

## **1.5 Methodology**

To achieve the aim and objectives of this dissertation, a range of review, quantitative, and qualitative methodologies were employed.

### **1.5.1 Study one**

First, a scoping review was conducted, with the goal of assessing the existing literature base for information on the use of social media as a point-of-care tool for emergency care practitioners worldwide.

It had the following objectives:

1. With regard to the use of social media platforms for real-time clinical consultation by emergency care practitioners:
  - a. Identify what social media platforms are currently being used in emergency care
  - b. Evaluate the potential impacts of social media use on patient outcomes
  - c. Describe the risks and benefits associated with social media use in this setting
  - d. Identify facilitators and barriers for social media use.
2. Identify gaps in the literature on the relationship between the use of social media and efficacy of clinical care in EUs.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist was used to guide all phases of the scoping review process, including identification of studies, data extraction, data analysis, and reporting.<sup>116</sup> Datapoints related to prevalence of use, outcomes, risks, and benefits were extracted from all included studies dating through 2022. This review was originally

conducted in 2020 and updated in 2022 for the purpose of providing the most accurate depiction of social media use in emergency care in this dissertation.

### **1.5.2 Study two**

Study two aimed to broadly describe the use of social media as a point-of-care tool by emergency care practitioners in Africa. It was the first phase (quantitative) of a two-phase sequential quantitative-qualitative mixed methods approach taken to obtain a comprehensive description of the use of social media by physicians as a point-of-care tool in facility-based emergency care in Africa.<sup>117</sup>

It had the following objectives:

1. Describe the demographic characteristics of African emergency care practitioners that use social media as a point-of-care tool.
2. Quantify prevalence of use of various social media platforms by African emergency care practitioners.
3. Describe African emergency care practitioners' social media usage habits and practices.
4. Understand African emergency care practitioners' attitudes towards use of social media in facility-based emergency care.

### **1.5.3 Study three**

Study three aimed to describe facility-based African emergency care practitioners' perception of, and intention to use, social media as a point-of-care tool. It was the second phase (qualitative) of a two-phase sequential quantitative-qualitative mixed methods approach being taken to obtain a comprehensive description of the use of social media

as a point-of-care tool in facility-based emergency care in Africa.<sup>117</sup> As in study two, it remained focussed on healthcare providers with medical degrees.

It had the following objectives:

1. Describe intentions to use social media as a point-of-care telemedicine tool in facility-based African emergency care,
2. Describe perceived risks and benefits to using social media as a point-of-care telemedicine tool in facility-based African emergency care, and
3. Describe perceived facilitators and barriers to using social media as a point-of-care telemedicine tool in facility-based African emergency care.

#### **1.5.4 Ethics**

Ethical approval for all work in this thesis was granted by the University of Cape Town (HREC REFS: 464/2017, 695/2020, and 036/2021). Full proposals and relevant approval letters are referenced within study chapters and included as appendices.

#### **1.5.5 Key definitions**

For the purpose of this study, **social media** was defined as, “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time.*”<sup>2</sup>

**Facility-based emergency care** is defined as “*care provided for a condition in which a delay in treatment is likely to result in the recipient's death or permanent impairment*” that is provided in healthcare institutions.<sup>118</sup>



**Point-of-care tools** were defined as, “*Research and reference resources that a clinician can utilise immediately at the point-of-care with a patient.*”<sup>119</sup>

### **1.5.6 Overview of study setting**

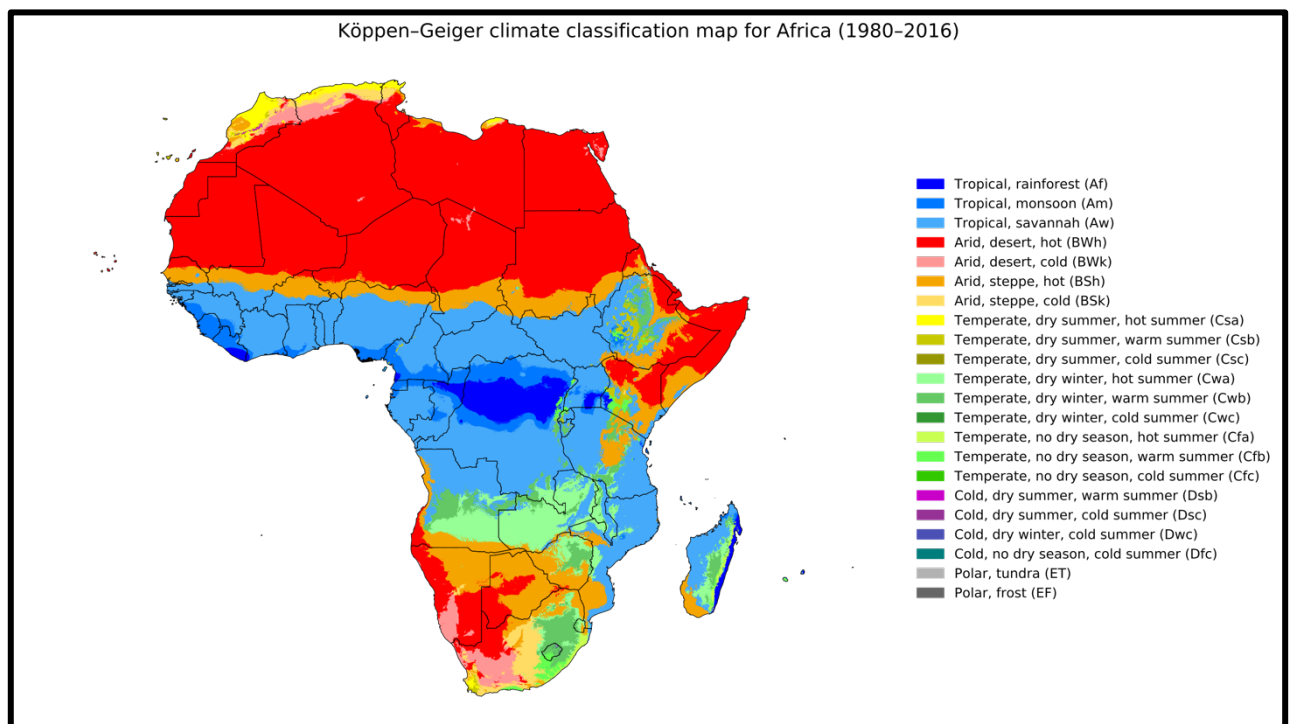
The real-world studies (Chapters 3 and 4) conducted in this dissertation sampled populations from the continent of Africa, with no specific emphasis on any region or county.

#### *Geographic, demographic, and socioeconomic information*

The African continent is vast, with its 54 countries covering 30.4 million square kilometres.<sup>120</sup> It is the second-largest continent, surpassed only by Asia, and consists of 48 countries on its mainland and six island nations.<sup>120</sup> Its landscape is varied, with countless mountains and highlands, rivers, and coastlines.<sup>120</sup> Major cities are geographically spread and almost all are coastal.<sup>121</sup>

Generally, Africa has the most tropical climate of all continents; the heat related to this tropical climate can lead to health challenges and generate an increased need for emergency care when temperatures are extreme.<sup>122</sup> Most the continent’s landmass in the northern and southern regions is considered arid desert, with the area along the equator being rainforests (Figure 1.2).<sup>122</sup> The combination of coastlines, extreme heat, and arid deserts puts much of the continent at ongoing risk of droughts and other natural disasters.<sup>123</sup> The continent is consistently ranked as the most vulnerable region in the world to the impacts of climate change.<sup>124</sup>

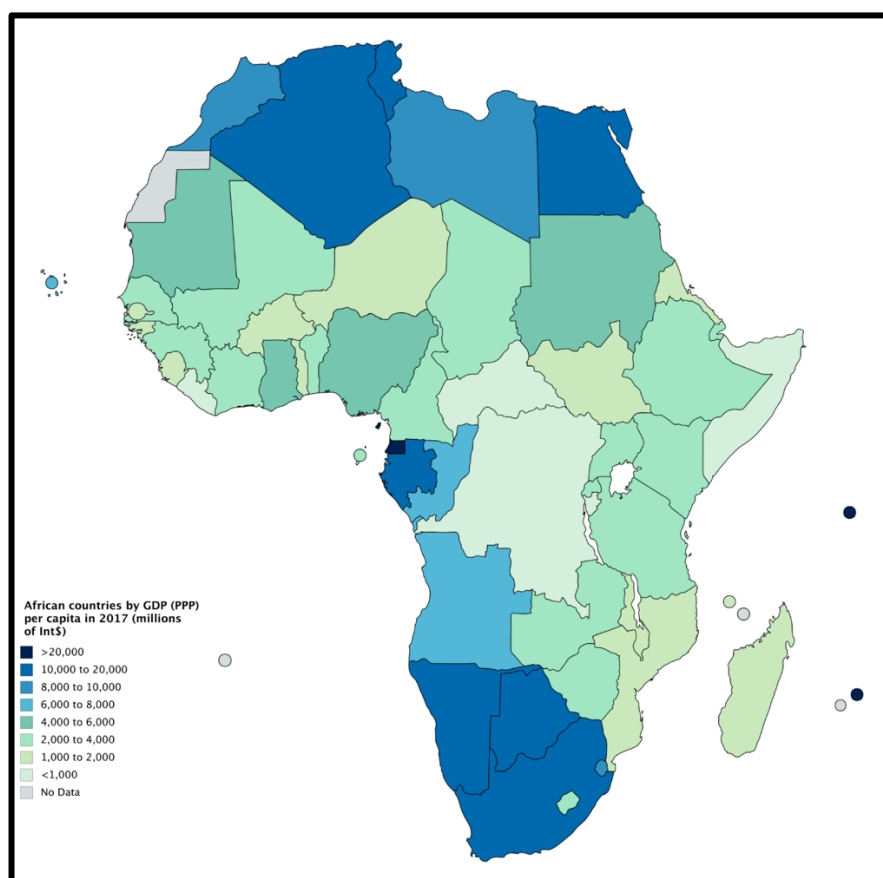
**Figure 1.2: Climate zones across Africa**<sup>122</sup>



Africa's population is large and rapidly growing.<sup>125 126</sup> A total of 1.4 billion people reside on the continent, and this number is expected to double before the year 2050.<sup>126</sup> The population is extremely young, with a median age of 18.9 years.<sup>127</sup> The fertility rate is extremely high, with an average 4.1 live births per woman; this is nearly double the rate of Oceania, which has the second-highest continental birth rate of 2.3.<sup>128</sup> Africa's total populace is smaller than only one other continent – Asia, with 4.7 billion people – but its age remains significantly lower than any other region of the world.<sup>127</sup> The second-lowest median age is 25.4 years in Central America.<sup>127</sup> Africa's large population has a low overall density of people to land, at 46.0 people per kilometre squared.<sup>127 129</sup> But, in actuality, much of its population is densely concentrated in cities, and urbanisation is increasing at faster rates than anywhere else on the globe.<sup>129 130</sup>

Despite a wealth of natural resources across the continent,<sup>131</sup> Africa is economically disadvantaged. A combination of factors has perpetuated the poverty seen in much of Africa, including persistent war and conflict, climate-related natural disasters, inadequate infrastructure, and a high burden of both communicable and noncommunicable diseases.<sup>132</sup> The average worldwide gross domestic product (GDP) per capita is \$10,300 U.S. Dollars.<sup>133</sup> Africa has the lowest mean GDP per capita of any continent, with a GDP per capita of \$1,809 and per capita GDPs ranging from \$793 in Burundi to \$29,837 in Seychelles (Figure 1.3).<sup>133 134</sup> In contrast, the second-lowest continental GDP per capita is \$5,635 in Asia, and the highest is \$37,477 in North America.<sup>133</sup> Africa has seen substantial economic growth in the past two decades, but increases in GDP seemed to have stalled in the last five years.<sup>134</sup> Africa's low GDPs are reflected in its countries' World Bank income level classifications: It has 24 LICs, 17 lower-middle-income countries, and six upper-middle-income countries. Only one country – Seychelles, an East African island with profitable tourism and fisheries industries – is considered high-income.<sup>135</sup>

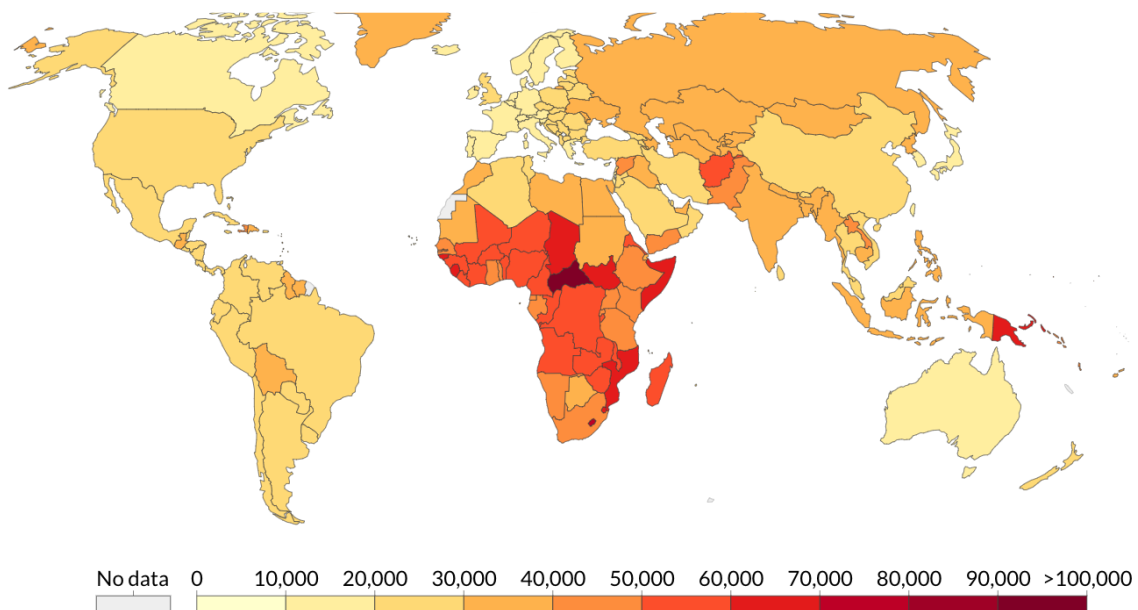
**Figure 1.3:** Gross domestic product (GDP) by country on the African continent<sup>136</sup>



### *Health status of the African region*

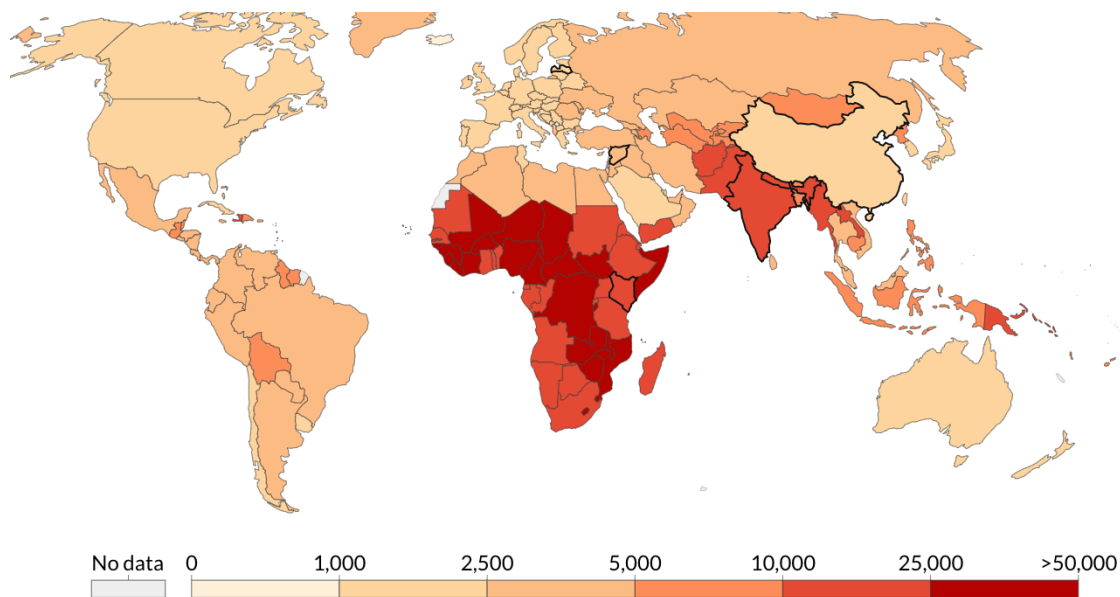
The health status of nearly all African nations is considered poor.<sup>137</sup> As depicted in Figure 1.4, the continent faces a much larger burden of death and disability related to disease and injury than any other region in the world.<sup>138</sup>

**Figure 1.4:** Global burden of disease distribution, in Disability-Adjusted Life Years (DALYs) per 100,000 individuals from all causes, 2019.<sup>138</sup>

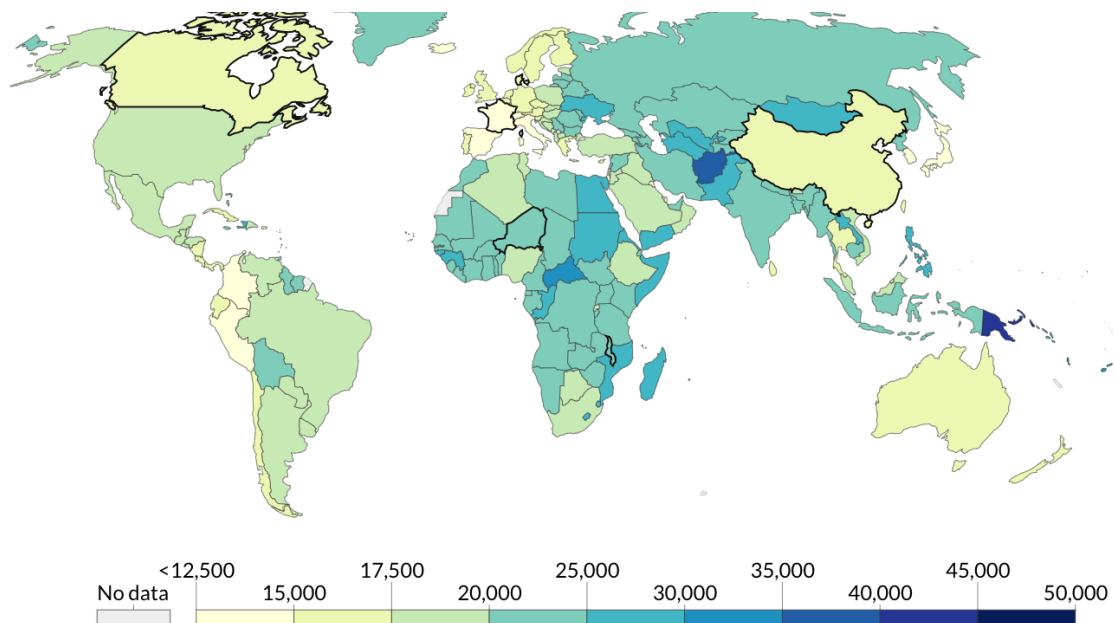


With high rates of both communicable and noncommunicable diseases, Africa faces what is known as the “double burden of disease”: While the continent has been unable to effectively mitigate many infectious diseases (Figure 1.5), it has also seen rapid rises in rates of chronic illnesses (Figure 1.6).<sup>139</sup> These individual burdens are each higher than on any other continent and contribute to the cycle of strain that African healthcare systems face.<sup>138 140</sup>

**Figure 1.5:** Global burden of infectious disease distribution, in Disability-Adjusted Life Years (DALYs) per 100,000 individuals from all causes, 2019<sup>138</sup>



**Figure 1.6:** Global burden of noncommunicable disease distribution, in Disability-Adjusted Life Years (DALYs) per 100,000 individuals from all causes, 2019<sup>138</sup>



Education is an important component of maintaining good health, and low literacy rates across the continent likely perpetuate poor health statuses.<sup>141</sup>

Life expectancies across the continent provide additional insight into the health of the African population. Despite these growing burdens of disease, the life expectancy in Africa has seen large increases. At present, Africans have an average life expectancy of 63.82 years.<sup>142</sup> The healthy life expectancy, which measures life expectancy with an adjustment for years with disability, has also been increasing, from 50.9 years in 2012 to 53.8 years in 2015.<sup>137</sup> Though growth has been seen across all countries, current life expectancies vary across the continent: The highest life expectancy is seen in Algeria, at 77.13 years, and the lowest in Chad, at 53.00 years.<sup>143</sup>

#### *African healthcare systems*

African healthcare systems remain some of the poorest and least developed in the world.<sup>137</sup> In the face of massive burdens of disease,<sup>138</sup> these systems have inadequate physical equipment and resources, shortages of trained healthcare providers, and insufficient monetary budgets to fund necessary care.<sup>144</sup> African nations have more than 25% of the world's disease burden but account for less than one percent of the world's health expenditures.<sup>138 145</sup> Population growth has led to the need for increased numbers of healthcare practitioners, but the continent cannot keep up with staffing demands.<sup>146</sup> It has a longstanding shortage of healthcare workers, as there are not enough educational programmes to train healthcare providers and many that are trained leave for better wages elsewhere in the world.<sup>146</sup> Insufficient government investments in public healthcare systems and corruption mean that systems cannot afford to pay high wages; it also leaves these systems short on physical resources such as medications and equipment.<sup>144 147 152</sup>

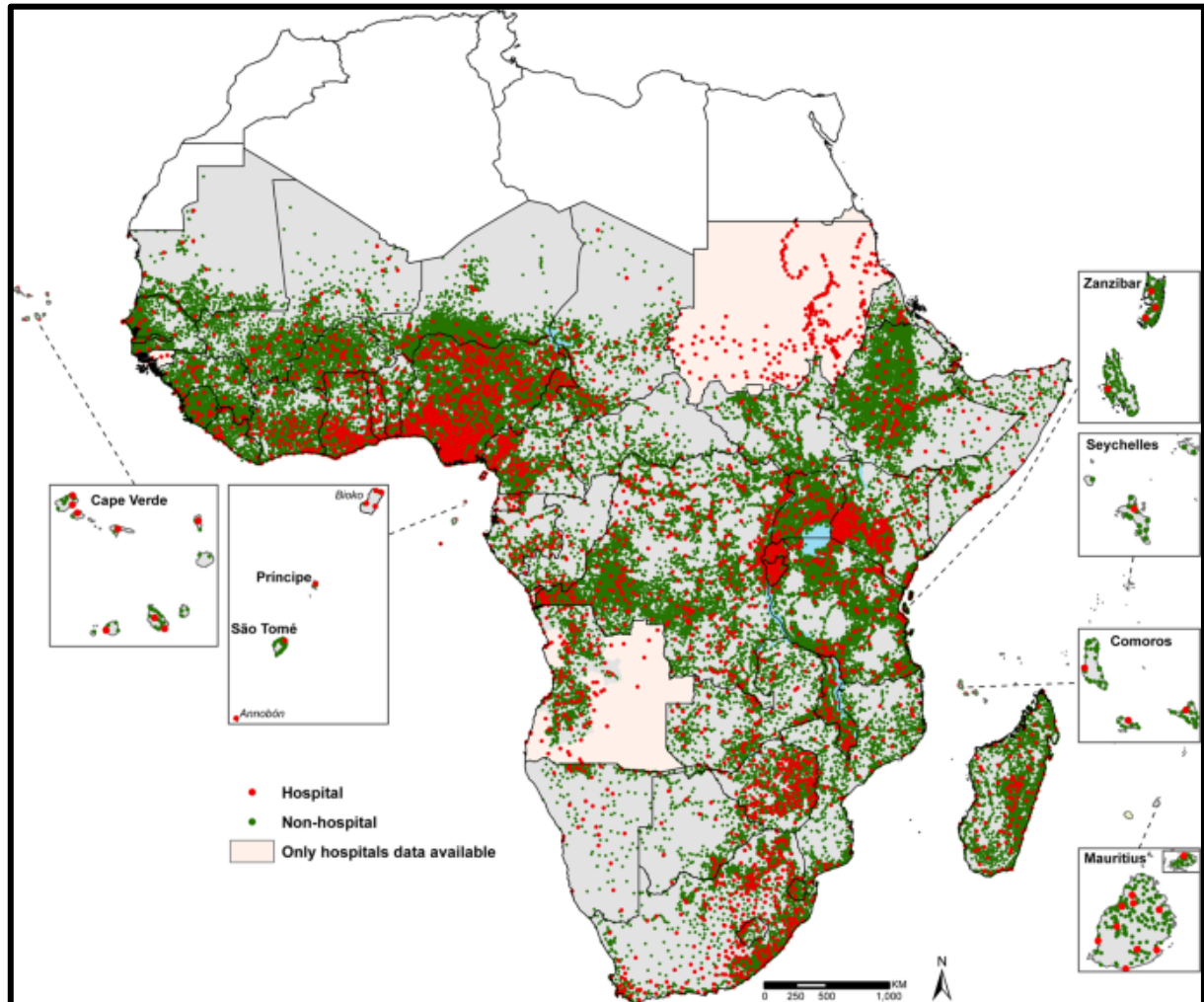
Unsurprisingly, these deficits have direct negative impacts on health outcomes for Africans.<sup>152</sup>

Most countries have some social health insurance scheme, wherein the government provides free or heavily subsidised healthcare to its citizens.<sup>148</sup> Unfortunately, very few public health systems in Africa offer what is known as universal health coverage (UHC), where full healthcare is guaranteed.<sup>149</sup> As of 2022, only 11 African nations offer free UHC to their citizens; most other countries have public systems but must pay additional out-of-pocket costs to utilise these services.<sup>149 150</sup> Public sector healthcare services in Africa are noted to be limited in their resources, lacking essential medications, equipment, and properly-trained healthcare workers.<sup>151 152</sup> Private healthcare systems exist, largely in cities, but the higher costs associated with these systems leads to only wealthier groups being able to afford private care.<sup>152 153</sup>

African healthcare is extremely inaccessible,<sup>137</sup> with only 52% of Africans having access to the timely and appropriate healthcare that they require.<sup>154</sup> Public hospitals are largely located in urban cities, creating healthcare deserts in many remote regions of the continent (Figure 1.7).<sup>155</sup>



**Figure 1.7:** Locations of public hospitals and other healthcare facilities across sub-Saharan Africa<sup>155</sup>



Even where healthcare facilities are accessible in Africa, the quality of services is considered low.<sup>152</sup> Private sector care quality can be better in some instances, but it is generally more variable, because there are fewer regulations surrounding provision.<sup>152</sup> The cost is also high: The average per capita spending on healthcare in African countries was \$83 and LICs, specifically, spend just \$25 per person annually.<sup>156</sup> This lack of public investment in healthcare leads to patients paying more than 30% of costs out-of-pocket.<sup>157 158</sup>

### *African emergency care*

The lack of prioritisation of emergency care on the global health agenda manifests in many ways within emergency care, including a significant shortage of adequately trained facility-based staff to populate EUs.<sup>87 159 160</sup> The majority of African countries have not recognised emergency medicine as a medical specialty, and the few nations that have only did so in the last decade.<sup>159</sup> Regardless, EUs in most of the continent are largely staffed by rotating or junior clinical personnel, who are often poorly equipped to handle the wide variety of acute presentations with the limited resources available to them.<sup>161</sup> Educational and training opportunities are not accessible or inadequate and this is further compounded by extremely limited access to best practice information or guidance appropriate for clinicians in LRS.

## **1.6 Structure of the dissertation**

The objectives of the PhD are achieved by this dissertation, which is comprised of three original research studies presented across five chapters.

The dissertation adheres to the following structure:

**Chapter 1** comprises a broad introduction to the dissertation. It delivers fundamental information on social media, emergency care, and the intersection of social media with healthcare. This chapter describes the motivations for this research and provides an overview of the study's setting: The African continent.

**In Chapter 2**, a scoping review is conducted to describe current use of social media a point-of-care tool for facility-based emergency care practitioners worldwide.

Following this, in **Chapter 3**, a cross-sectional survey is used to describe the prevalence of, and attitudes towards, use of social media specifically by physicians in facility-based African emergency care.

**Chapter 4** uses the information obtained in Chapter 3's survey as a baseline to inform in-depth one-on-one interviews with African emergency care practitioners. Content analysis of these interviews provides additional insight into providers' views, attitudes and behaviours towards social media use to enhance bedside emergency care.

**Chapter 5** completes the dissertation with a broad discussion of research implications. It describes this dissertation's contributions to the literature and notes the key limitations of findings. It also highlights next steps to continue evaluating and improving the use of social media in facility-based emergency care, including intended postdoctoral work.

## **Chapter 2: Scoping review on the use of social media as a point-of-care tool for facility-based emergency care practitioners worldwide.**

### **2.1 Introduction**

Social media is being used in healthcare,<sup>104</sup> and it is unlikely that this practice can be stopped, despite ethical objections and concerns related to privacy and security.<sup>71 110 112</sup> Anecdotes and research studies suggest that a range of social media applications are informally used worldwide for a number of professional purposes, including consultations, networking, and education.<sup>162</sup> In many instances, these platforms are being used to obtain real-time advice on actual patients, which involves transfer of sensitive information. Despite the risks inherent to such communications, the potential of social media to improve health information sharing and patient outcomes in emergency care settings cannot be underestimated. Real-time point-of-care support may be particularly beneficial for healthcare providers in LRS, who may lack adequate training or access to information.<sup>163</sup>

Despite the frequent use of social media in healthcare and many mentions in the literature that controlling its use must be a priority,<sup>164 165</sup> there exist very few established protocols for social media use in healthcare settings, and none of these guidelines have been purpose designed for LRS.<sup>166</sup> Three large national medical organisations have put out position statements: The World Medical Association,<sup>167</sup> American Medical Association,<sup>168</sup> and the British Medical Association.<sup>169</sup> These guidelines emphasise that physicians have the duty to protect patient privacy as defined in their country or region, and that patient health information (PHI) is considered extremely sensitive data. They emphasise that social media posts and messages are often public and permanent, and that caution

should be exercised when sharing anything related to patients or professional matters. Unfortunately, these guidelines are non-binding and contain few actionable points that could be implemented at the facility level to structure and inform social media use. Furthermore, no evidence could be found of implementation of any of the aforementioned guidelines at specific healthcare facilities.

Two organisations – the American College of Emergency Physicians (ACEP)<sup>170</sup> and the Council of Residency Directors (CORD) Social Media Task Force<sup>171</sup> – have developed general guidance for social media use specifically in emergency care settings. Similar to the general medical organisations' recommendations, the ACEP document covers ethical concerns and cautions that physicians be judicious with social media use, but there is no practical or implementable guidance.<sup>170</sup> CORD's Social Media Task Force held a stakeholder meeting to describe social media concerns for emergency medicine residents, and developed actionable guidance that residency programs could tailor to create and implement a social media use plan.<sup>171</sup> They provide specific recommendations for content management and communication, although these suggestions focus largely on social media communication with the broader public, and not on its use for real-time consultations.

## **2.2 Motivation**

Guidance on safe and ethical use of social media in healthcare settings, particularly in cases of point-of-care consultation, is critical.<sup>172</sup> Unfortunately, there is a lack of guidance on how to safely and effectively use social media in healthcare and, specifically, emergency care. Furthermore, no guidelines are available that are specifically designed for LRS, where clinicians may be even more likely to rely on social media to improve

provisions of patient care. It is essential that practical guidelines be developed that can inform the appropriate use of social media in LRS emergency care. In order to do this, a more in-depth understanding of the current uses and perceptions of using social media in clinical emergency care must be developed. A scoping review is an essential first step in evaluating the landscape of social media use in emergency care prior to developing guidance. But prior to this work, there had been no reviews of the literature on point-of-care social media use in any region of the world or in emergency care settings to inform such guidelines.

### **2.3 Aim and objectives**

Study one aimed to systematically map the available literature on the use, outcomes, benefits, and risks pertaining to social media as a point-of-care tool in facility-based emergency care worldwide.

It had the following objectives:

3. With regard to the use of social media platforms for real-time clinical consultation by emergency care practitioners:
  - a. Identify what social media platforms are currently being used in emergency care,
  - b. Evaluate the potential impacts of social media use on patient outcomes,
  - c. Describe the risks and benefits associated with social media use in this setting, and
  - d. Identify facilitators and barriers for social media use.
4. Identify gaps in the literature on the relationship between the use of social media and efficacy of clinical care in EUs.

## **2.4 Methods**

### **2.4.1 Selection of scoping review methodology**

A scoping review was selected as the ideal methodology for evaluating the evidence base for social media use in clinical emergency care. Scoping reviews are beneficial for informing gaps in existing evidence and developing research to fill these needs.<sup>173</sup> These reviews, which are often referred to as “mapping reviews,” have flexible data extraction and analysis methodologies.<sup>174 175</sup> They are inclusive of evidence from a range of sources, regardless of quality and are suitable in instances where the evidence base is unknown but likely limited.<sup>176</sup> Scoping reviews include research studies but can also look beyond primary research to assess other types of publications, such as policy documents.<sup>177</sup> The high-level, inclusive nature of scoping reviews lends to outcomes that are approachable and simple to understand. This has led to rapid growth in their use and makes them ideal for researchers that may be working with non-scientists (e.g., policymakers) to set and motivate research agendas.<sup>177</sup>

An alternative to the scoping review is the systematic review, which aims to provide critical appraisal of an evidence base with an emphasis on assessing study quality and bias. Systematic reviews tend to be most appropriate in studies where the intention is to inform clinical decision making.<sup>177</sup> Given that this study aims to provide a broad overview of how social media is being leveraged in emergency care, the systematic review methodology was less appropriate.

Prior to this study, no previous scoping reviews have been conducted on the use of social media specifically as a point-of-care tool in emergency care. A preliminary scan of the

literature suggested that the existing evidence would be limited and varied, making a scoping review the best fit for evaluation.

#### **2.4.2 Guiding frameworks**

The framework for systematic scoping reviews developed by Peters et al. was used to guide this study.<sup>176</sup> As recommended in the framework, the protocol for this work was developed *a priori*, in advance of any in-depth evaluation of the existing literature (Appendices 2.1 and 2.2).<sup>176</sup> This framework also provided guidance on the data extraction and analysis processes, and

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist was used to guide all phases of the scoping review process, including identification of studies, data extraction, data analysis, and reporting (Appendix 2.3).<sup>116</sup>

#### **2.4.3 Search strategy**

This study followed a three-step search strategy, as defined by the Joanna Briggs Institute.<sup>178</sup> A search strategy was developed to identify all literature that describes either the use of, or perceptions surrounding use of social media in facility-based emergency care (Appendix 2.4). The search strategy included terms related to emergency care (e.g., “Emergency Medicine” or “Emergency Care” or “Emergency Department” or “Emergency Unit”) and social media (e.g., “Social Media” or “Social Network” or “WhatsApp” or “Facebook” or “Instagram” or “Twitter” or “Telegram” or “YouTube”). Although this dissertation’s interest lies in emergency care practised in LRS, no restrictions were placed on location so as to gather a global picture of social media use in emergency care. Five



databases – PubMed, Scopus, Web of Science, Embase, and Google Scholar – were searched using the search engine-specific strategies described in Appendix 2.4. Additional targeted searches were undertaken using Google and Open Grey to identify grey literature that may have been missed in the original search. Finally, reference lists for all systematic and scoping reviews, and meta-analyses, were interrogated to identify any additional potential sources.

#### **2.4.4 Inclusion and exclusion criteria**

Inclusion and exclusion criteria were developed and applied at all stages of text review.

##### *Inclusion criteria*

The following criteria were used in reviewing titles, abstracts, and full texts to determine eligibility for inclusion in this review:

- Full text available in English
- Published on or after January 1, 2010
- Contains primary empirical data
- Published in a peer reviewed journal
- Any study design, including randomised trials and observational studies
- Describes social media use or perceptions of use by emergency care practitioners for point-of-care purposes (refer to Section 1.5.5, “Key Definitions”, for definitions of social media, facility-based, and point-of-care)
- Study participants must be clinicians providing healthcare in facility settings (e.g., hospitals and EUs)

### *Exclusion criteria*

Studies were excluded if any of the following criteria were met:

- Full text not available in English
- Publication date prior to January 1, 2010
- Contains secondary data (e.g., scoping and systematic reviews), commentary, position statements, or opinions
- Full text not published in a peer reviewed journal (including instances where only a conference proceedings and abstract is published in a peer reviewed journal)
- Publications that describe study protocols but does not include results
- Does not describe social media use or perceptions of use by emergency care practitioners for point-of-care purposes (refer to Section 1.5.5, “Key Definitions”, for definitions of social media, facility-based, and point-of-care)
- Describes social media use for provider or patient education purposes, including Free Open Access Medical Education (FOAMed)
- Participants are not clinicians providing healthcare in facility-based settings (e.g., hospitals and EUs)

Note that, in cases where full texts could not be identified, attempts were made to contact the authors to obtain the full text for review. Reference lists of scoping and systematic reviews were interrogated to identify additional articles for potential inclusion.

### **2.4.5 Key definitions**

Key definitions adhered to in this study are described in Section 1.5.5, Key definitions.

#### **2.4.6 Screening of sources**

Two reviewers with training in scoping review methodology independently evaluated all studies identified in the literature search at three stages: title, abstract, and full-text.<sup>176</sup> Inclusion and exclusion criteria defined in Section 2.4.3 were used to determine whether a study should be included at each stage. Discrepancies in agreement for inclusion or exclusion were resolved via discussion, and a third independent reviewer served as a tie breaker when the two initial reviewers could not reach agreement.

#### **2.4.7 Data extraction**

A data extraction template was developed that included fields for all relevant study data points, including year of publication, authors, country and country income level, aim and rationale, methodology, and key findings related to the study question. This template was developed based on the guidance of Peters et al., who define these fields as crucial for any systematic scoping review.<sup>176</sup>

The template was piloted amongst reviewers and refined prior to implementation. Data from all included studies were dually abstracted and reviewed for agreement across all fields. A final version of the data extraction was created by merging information from the two individual reviewers' copies.

Note that no critical appraisal or risk of bias assessment was conducted for this study. This decision was made in line with standard guidelines for scoping reviews, which suggest that the heterogeneity of studies and other documents identified are unlikely suitable for a singular assessment of bias.<sup>177 179</sup> To reduce risk of bias in interpretations,

methodological limitations of specific studies are described as is necessary in the Results (Section 2.5) and Limitations (Section 2.7) of this chapter.<sup>180</sup>

#### **2.4.8 Data analysis**

As is recommended by the Joanna Briggs Institute, basic descriptive analysis was conducted for extracted data.<sup>177</sup> Summary tables are provided describing the locations and types of studies, areas of clinical interest, and methodologies used. The PRISMA guidelines were used to structure the findings in a narrative summary, with a thematic approach taken to describe overarching trends across studies. Sources of evidence were described at the individual level and an overall synthesis was also provided.<sup>116</sup>

#### **2.4.9 Ethical considerations**

Ethical approval for this study was granted by the University of Cape Town Human Research Ethics Committee (HREC REF: 464/2017) (Appendices 2.2 and 2.3).

All components of this study will be extracted from existing studies that are publicly available. No part of the study will use, or encourage the use of, social media in clinical or other professional settings. All parts of this research will provide simple descriptions of current practices surrounding the use of social media. Legal implications related to privacy and clinical risk should not be of concern in this scoping review.

### **2.5 Results**

#### **2.5.1 Included texts**

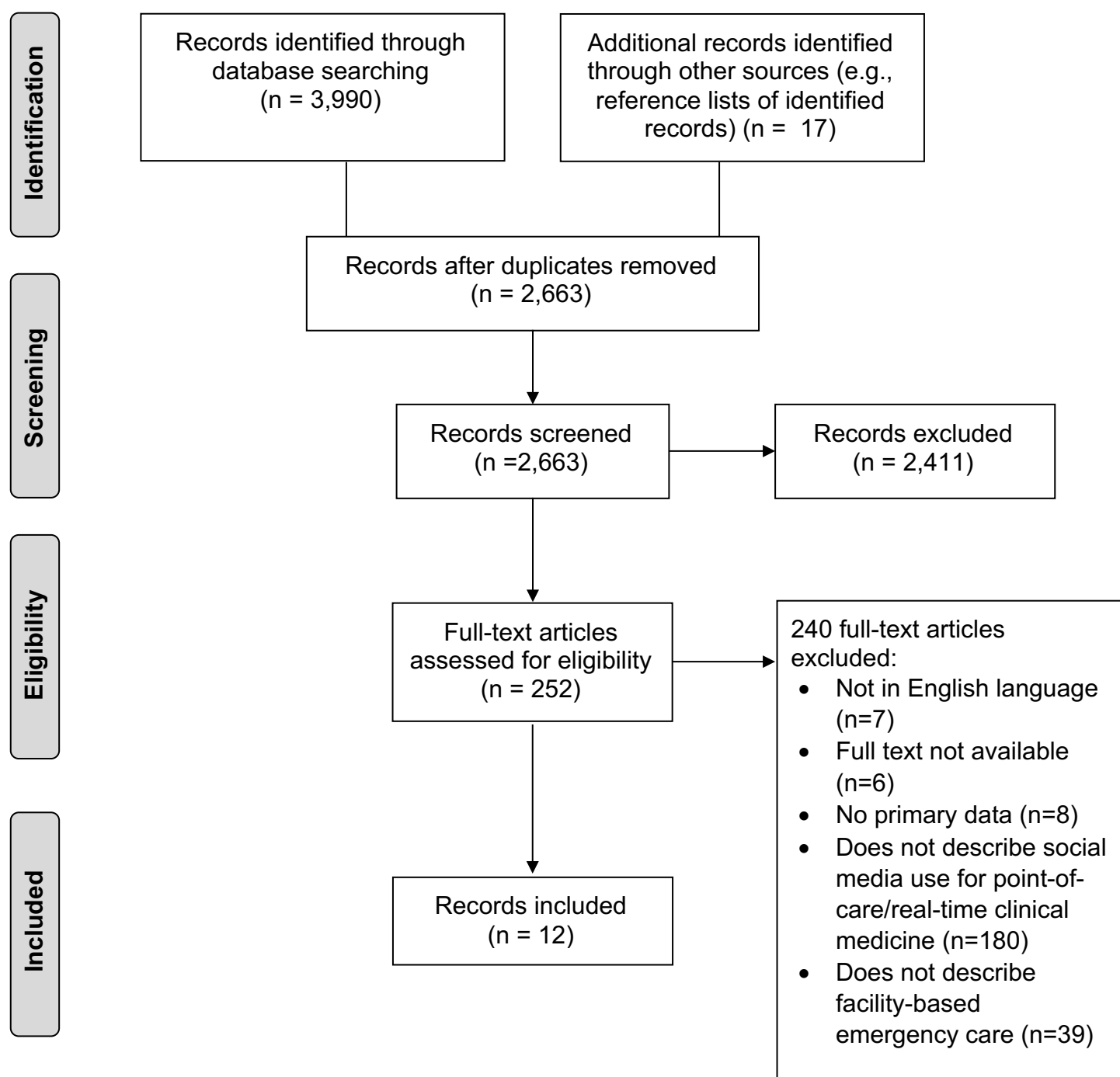
A total of 3,990 publications were identified through searches against five well-known databases, OpenGrey, and Google. An additional 17 records were identified via

interrogation of scoping and systematic reviews identified in the original search. Following removal of 1,344 duplicates, 2,663 records remained. Title screening removed 1,679 of these articles, and abstract screening removed an additional 732 records.

Following title and abstract screening, 252 articles were assessed for eligibility at the full-text level. Nearly all of these articles were excluded upon full-text screening. The full text was unavailable in six instances and not available in English in seven instances. Primary data was missing in eight articles. Many studies (n=180) did not meet criteria due to not describing social media use as a point-of-care tool. In 12 of these cases, this was because it was instead described as a tool for patient use, and in nearly all other instances, it was described as a tool for research, professional networking, or education. A further 39 articles were excluded due to not describing facility-based emergency care. For example, 12 studies described social media use in the context of emergency medical services (EMS) care.

In total, 12 full texts met all inclusion criteria and were included for this scoping review. The full screening process is described below in Figure 2.1.

**Figure 2.1:** PRISMA flow diagram<sup>176 181</sup>



### **2.5.2 Overview of included studies**

The 12 studies identified by this scoping review were published within the last eight years, between 2014 and 2021. Studies had a mean length of 11.1 months (standard deviation (SD) = 6.4 months). In most cases, studies were published within two years of the study period end date, and study periods went back as far as 2012.

Studies included in this scoping review came from just six countries. More than half of identified studies (n=7, 58.3%) came out of one country: Turkey. One study (8.3%) came from each of the following countries: Brazil, Israel, Malaysia, Saudi Arabia, and South Africa. Nearly all studies (n=10, 83.3%) were set in upper-middle-income countries, as defined by the World Bank's Income Level Classifications.<sup>182</sup> Two studies – those from Saudi Arabia and Israel – were considered HICs.<sup>182</sup> No identified studies came from lower-middle-income countries or LICs.

There was some overlap in authorship within the six papers from Turkey: Gulacti and Lok were co-authors on three of these.<sup>183 184 185</sup> No other authors were found to be represented on more than one paper.

A detailed overview of included studies, including information on study settings, study dates and publication dates, and objectives for conducting research is provided in Table 2.1 below.

**Table 2.1:** Metadata of included studies

<b>Title</b>	<b>Authors</b>	<b>Public- ation year</b>	<b>Study period</b>	<b>Study country</b>	<b>World Bank Income Level<sup>182</sup></b>
Implementing "Chest Pain Pathway" Using Smartphone Messaging Application "WhatsApp" as a Corrective Action Plan to Improve Ischemia Time in "ST-Elevation Myocardial Infarction" in Primary PCI Capable Center "WhatsApp-STEMI Trial" <sup>186</sup>	Alhejily WA	2021	August 2020 - April 2021	Saudi Arabia	High-income
WhatsApp as an Emergency Teleradiology Application for Cranial CT Assessment in Emergency Services <sup>187</sup>	Inan I, Algin A, Sirik M	2020	January 2017 - May 2018	Turkey	Upper-middle-income
Use of WhatsApp for Polyclinic Consultation of Suspected Patients With COVID-19: Retrospective Case Control Study <sup>188</sup>	Sabırlı R, Karslı E, Canacık O, Ercin D, Çiftçi H, Şahin L, Dolanbay T, Tutuncu EE	2020	March 2020 - May 2020	Turkey	Upper-middle-income
The reliability of use of WhatsApp in type 1 and type 2 pediatric supracondylar fractures <sup>189</sup>	Kapıcıoğlu M, Erden T, Ağır M, Küçükdurmaz F	2019	November 2017 - March 2018	Turkey	Upper-middle-income
Reliability and accuracy of smartphones for paediatric infectious disease consultations for children with rash in the paediatric emergency department <sup>190</sup>	Devrim İ, Düzgöl M, Kara A, Çağlar İ, Devrim F, Bayram N, Apa H	2019	January 2015 - January 2017	Turkey	Upper-middle-income



<b>Title</b>	<b>Authors</b>	<b>Public- ation year</b>	<b>Study period</b>	<b>Study country</b>	<b>World Bank income level<sup>182</sup></b>
Comparison of secure messaging application (WhatsApp) and standard telephone usage for consultations on Length of Stay in the ED. A prospective randomized controlled study <sup>183</sup>	Gulacti U, Lok U	2017	November 2015 - February 2016	Turkey	Upper-middle-income
The m-Health revolution: Exploring perceived benefits of WhatsApp use in clinical practice <sup>191</sup>	Ganasegeran K, Renganathan P, Rashid A, Al-Dubai SA	2017	2015	Malaysia	Upper-middle-income
The value of WhatsApp communication in paediatric burn care <sup>192</sup>	Martinez R, Rogers AD, Numanoglu A, Rode H	2017	April 2015 - October 2016	South Africa	Upper-middle-income
Reliability of smartphone-based teleradiology for evaluating thoracolumbar spine fractures <sup>193</sup>	Stahl I, Dreyfuss D, Ofir D, Merom L, Raichel M, Hous N, Norman D, Haddad E	2017	2014	Israel	High-income
An Analysis of WhatsApp Usage for Communication Between Consulting and Emergency Physicians <sup>184</sup>	Gulacti U, Lok U, Hatipoglu S, Polat H	2016	January 2014 - July 2014	Turkey	Upper-middle-income
Use of WhatsApp application for orthopedic consultations in the ED <sup>185</sup>	Gulacti U, Lok U, Çelik M	2016	January 2015 - July 2015	Turkey	Upper-middle-income
WhatsApp Messenger is useful and reproducible in the assessment of tibial plateau fractures: inter- and intra-observer agreement study <sup>194</sup>	Giordanoa G, Kochb HA, Mendesa CH, Bergamina A, de Souzaa FS, do Amarala NP	2014	June 2012 - July 2013	Brazil	Upper-middle-income

### 2.5.3 Aims of included studies

The 12 included studies focused on applications of social media to a range of clinical topics within emergency care (Table 2.2). The majority (n=9, 75.0%), focussed on adult patients, while 25% (n=3) applied social media to paediatric emergency care settings.

**Table 2.2:** Clinical topics of interest in included studies

Age group	Clinical topic	Total studies (n (%))
Adult (≥ 18 years old)	All emergency cases requiring consultation <sup>183 191 184</sup>	3 (25.0)
	COVID-19 <sup>188</sup>	1 (8.3)
	Head trauma <sup>187</sup>	1 (8.3)
	Orthopaedic injuries <sup>185</sup>	1 (8.3)
	ST-elevation myocardial infarction <sup>186</sup>	1 (8.3)
	Thoracolumbar spine fractures <sup>193</sup>	1 (8.3)
	Tibial plateau fractures <sup>194</sup>	1 (8.3)
Paediatric (<18 years old)	Burn care <sup>192</sup>	1 (8.3)
	Supracondylar fractures <sup>189</sup>	1 (8.3)
	Infectious rashes <sup>190</sup>	1 (8.3)

Despite the variety of clinical applications, all included studies (n=12, 100%) focused solely on WhatsApp as the social media platform of interest.

Two main themes were distilled from the aims, and rationales provided in the 12 included studies: 1) the diagnostic power of images transmitted via WhatsApp, versus traditional methods like Picture Archiving and Communication System (PACS) and, 2) the impact of WhatsApp consultations on time to consultant review, emergency care, and discharge.

### *Theme one: The diagnostic power of images transmitted via WhatsApp*

Within the first theme – the diagnostic power of WhatsApp – five studies aimed to evaluate remote consultation of several types of images via WhatsApp.<sup>187 189 190 193 194</sup> In two studies, computed tomography (CT) scans were of interest,<sup>187 193</sup> and in one study, only x-rays were reviewed.<sup>189 193</sup> In an additional study, both x-ray and CT images were assessed.<sup>194</sup> One study focussed on the diagnostic power of WhatsApp for images of rashes.<sup>190</sup> All of these studies were interested in inter- and/or intra-rater reliability of image or video transfer via WhatsApp. Two of these studies were also seeking to explore accuracy in comparison to the routine process, which is done using a PACS with a screen that is much larger than a smartphone.<sup>189 193</sup>

Generally, these diagnostic studies shared a guiding rationale that there are logical concerns inherent to moving from routine use of PACS and other large computer screens to the small screens of mobile phones on which WhatsApp is used. They noted that there are issues related to loss of image quality and granulation when smaller screens are used and that it was unknown how this might affect image reading. Another point of concern was that use of electronically transmitted images to providers in other parts of the facility or off-grounds reduced verbal communication between the practitioner that ordered the imaging and the reader, which could impact diagnostic power. Many of these studies acknowledged that the practice of image sharing via WhatsApp was already happening at an anecdotal level, and that the concerns were unlikely to outweigh the benefits of real-time consultation. Therefore, authors felt it was essential that potential quality loss issues be explored before guidance was developed.

### *Theme two: The impact of WhatsApp consultations on time to care*

The second research theme identified in this scoping review was the impact of WhatsApp consultation on a range of facility metrics, including time-to-consultation, time-to-care, and EU and facility lengths of stay. A total of seven studies were identified with this theme,<sup>186</sup><sup>188</sup> <sup>183-185</sup> <sup>191</sup> <sup>192</sup> and the clinical applications within this theme varied. Some studies focussed how WhatsApp consultations affect time to specific care end-points, such as treatment for COVID-19,<sup>188</sup> paediatric burns,<sup>192</sup> orthopaedic injuries,<sup>185</sup> or ST-elevated myocardial infarction (STEMI).<sup>186</sup> Other studies evaluated the general impacts of WhatsApp consultations on time-to-care, time-to-admission, and EU and overall facility lengths of stay.<sup>183</sup> <sup>191</sup> Two studies noted understanding how remote WhatsApp consultations impact care at night, when many providers have left facility grounds, as a key study objective.<sup>184</sup> <sup>185</sup>

Although these studies shared a common goal of assessing the impacts of WhatsApp on time-to-care and length of care, the rationales motivating these studies varied greatly. Broadly, there was a general hypothesis that video or messaging consultations through a secure platform such as WhatsApp solved many of the logistical challenges of busy clinicians providing emergency care. However, the core intentions of these studies differed. For example, in the instance of using WhatsApp to speed up consultations as a way of increasing time from door-to-balloon procedure in STEMI patients, the rationale was that the time it takes to receive an ECG reading and/or balloon procedure are indicators of the quality of clinical care facilities provide for cardiac patients.<sup>186</sup> In another study, the motivator for assessing WhatsApp for COVID-19 patients was two-fold. <sup>188</sup> Firstly, COVID-19 exposure (for both other patients and providers) increases when patients have longer wait times. In addition to that, the pandemic itself was limiting the

bandwidth of providers; WhatsApp was a tool that could potentially allow them to “be in multiple places at one time” and provide consultations with exposure risk. Just one study noted the challenges of resource-limited settings as its motivator.<sup>192</sup> The paediatric burn care out of South Africa study noted that providing quality care for children with burns is challenging in low-income settings, where it is hindered by a number of barriers, including poor resource allocation and lack of provider education.

Additional information on the purposes of included studies, including specific aims and rationales, can be found in Table 2.3 below.

**Table 2.3:** Aims of included studies

Article	Study aim(s)	Study rationale	Social media platform(s) of interest
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>			
Devrim et al. 2019 <sup>190</sup>	The aim of this study was to assess reliability and accuracy of smartphones when used for diagnosing rashes in children admitted to EUs during night shifts.	Smartphones and mobile applications are the most common means of communication among the general population, and their use by healthcare workers on the job is steadily increasing. These applications have incredible potential for improving patient outcomes, particularly when specialists are not present on-site for consultation. However, little is known about the reliability of smartphone use for real-time medical consultations.	WhatsApp
Giordano et al., 2014 <sup>194</sup>	This study sought to evaluate inter- and intra-observer agreement in the initial diagnosis and classification of tibial plateau fractures using x-rays and CT scans photographed and sent via WhatsApp.	The increasing popularity of smartphones is driving a growing interest in the use of these devices as diagnostic tools. WhatsApp, a free messaging application that allows for sharing of high-resolution images, is of particular interest in the field.	WhatsApp

Article	Study aim(s)	Study rationale	Social media platform(s) of interest
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>			
Inan et al., 2020 <sup>187</sup>	This study aimed to evaluate the diagnostic power and interobserver reliability cranial CT images via WhatsApp teleconsultation compared to the current workstation-based review of images.	Use of social media applications (e.g., WhatsApp) for radiological consultations are controversial, with concerns related to image and photo degradation and risks to patients. Loss of image quality is particularly concerning in small pathologies, which may be missed if image quality decreases. Real-time radiology consultations are critical in emergencies, and it is essential that the diagnostic power of messaging-based consultations is evaluated to understand the potential implications of these consults on patient care.	WhatsApp
Kapıcıoğlu et al. 2019 <sup>189</sup>	This study sought to assess the reliability of using WhatsApp to assess X-ray images for traumatic elbow injuries in children, compared to Picture Archiving and Communication System (PACS).	There are a number of concerns related to using smartphones (and the associated social media applications) for radiology consultations, including reduced verbal communication, data privacy, and loss of image quality on smaller screens (compared to full-size PACS screens).	WhatsApp

Article	Study aim(s)	Study rationale	Social media platform(s) of interest
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>			
Stahl et al., 2017 <sup>193</sup>	This study aimed to compare the reliability of orthopaedic surgeons interpreting CT scans for thorocolumbar spine fractures via two methods: 1) video clips of CT images sent via WhatsApp and 2) scans viewed directly on PACS.	Timely interpretation of CT scans is critical to diagnosing and managing spinal column fractures. It has become commonplace to capture videos of CT scans and share them via instant message when consultant physicians are not available on site.	WhatsApp
<i>Theme two: The impact of WhatsApp consultations on time to care</i>			
Alhejily, 2021 <sup>186</sup>	This study aimed to assess the impacts of using the chest pain pathway with real-time point-of-care feedback from consultants via WhatsApp on 1) EU door-to-electrocardiogram (ECG) time, and 2) door-to-balloon time.	Time to receiving ECGs and balloon are indicators of overall performance in caring for patients with acute coronary syndrome.	WhatsApp



Article	Study aim(s)	Study rationale	Social media platform(s) of interest
<i>Theme two: The impact of WhatsApp consultations on time to care</i>			
Ganasegeran et al., 2017 <sup>191</sup>	This study aimed to investigate the perceived benefits of WhatsApp use by providers in EUs and medical clinic settings.	Clinical communications in large team practice settings can be limited by hierarchies, schedules, and immediate availability of other providers. Social media applications such as WhatsApp, which are available in real-time on smartphones, provide a solution to many of these logistical challenges.	WhatsApp
Gulacti & Lok, 2017 <sup>183</sup>	This study aimed to determine the effects of WhatsApp consultation on EU consultation time and length of stay.	Consultations in the EU can be time consuming, because physicians must identify and obtain input from specialists in other areas of the hospital, but they are an essential and common part of EU care.	WhatsApp
Gulacti, Lok & Çelik, 2016 <sup>185</sup>	The aim of this study was to investigate the use of WhatsApp for communication between orthopaedic consultants and EU physicians.	Verbal report via telephone is typically used for consultations by orthopaedists. However, this method does not allow for the transfer of images in real-time, substantially limiting consultant input.	WhatsApp

Article	Study aim(s)	Study rationale	Social media platform(s) of interest
<i>Theme two: The impact of WhatsApp consultations on time to care</i>			
Gulacti et al., 2016 <sup>184</sup>	The aim of this study was to describe how WhatsApp is being used for communications between consulting and emergency physicians.	WhatsApp Messenger has been used for clinical communication between physicians in healthcare but, prior to this study, no research had been conducted on the use of WhatsApp specifically in EUs.	WhatsApp
Martinez et al., 2017 <sup>192</sup>	The aim of this study was to review the use of WhatsApp to facilitate paediatric burn injury consultations to a regional burn centre in a low-resource setting.	Burn care is challenging in low-income settings, where appropriate care is hindered by a number of barriers, including poor resource allocation and lack of provider education. WhatsApp is a no-cost, user-friendly encrypted social media application that does not require any expensive physical and personnel infrastructure. This application may have utility in improving burn care in low-resource settings.	WhatsApp
Sabırlı et al., 2020 <sup>188</sup>	The aim of this study was to assess the effects of WhatsApp video consultation with infectious disease specialists on COVID-19 patient EU admission and discharge times, in comparison to bedside consultation.	The COVID-19 pandemic introduced the need for effective video consultation strategies to reduce disease transmission. However, it was unknown how these real-time video consultations might affect the amount of time to hospital admission and length of stay in COVID-19 patients.	WhatsApp

## 2.5.4 Methodology of included studies

Included studies used a range of methodologies were used to assess the use and impacts of social media on facility-based emergency care (Table 2.4).

**Table 2.4:** Types of studies identified

Type of study	Total studies (n (%))
Retrospective imaging review	5 (41.7)
Retrospective chart review	3 (25.0)
Prospective chart review	1 (8.3)
Retrospective case-control	1 (8.3)
Prospective randomised controlled trial	1 (8.3)
Cross-sectional survey	1 (8.3)

Nearly all studies (n=9, 75.0%) were retrospective, meaning that individuals were identified, and information was collected about their past medical history and interaction(s) with the emergency care system.<sup>187-189 184 185 190 192-194</sup> Two studies (16.7%) were prospective. In the case of Alhejily's study, this took the form of a prospective chart review, wherein patients were enrolled in the study upon EU arrival if they met certain criteria and followed over their EU and facility journeys.<sup>186</sup> Gulacti and Lok conducted the only randomised trial, which prospectively enrolled patients required EU consultations into two groups to compare outcomes of WhatsApp-based and in-person consultations.<sup>183</sup> One study – a cross-sectional survey – did not have directionality attached to it, as the questionnaire was conducted at a single point in time.<sup>191</sup>

Each article set forth specific criteria for inclusion in its study, primarily restricting on age and reason for presentation. All included studies used a sample strategy known as non-

probability sampling, where all patients that meet predefined criteria are included in the study population.

*Theme one: The diagnostic power of images transmitted via WhatsApp*

The five studies aiming to understand the power of WhatsApp for imaging diagnostics shared similar methodologies. All of these studies were considered retrospective image reviews, meaning that patients were identified via medical records and historical images were viewed for the purposes of the research. They looked at reliability, which is the level of agreement between imaging readings. In three cases, intra-observer reliability was leveraged to assess this agreement; this is when the same observer reviews the same image at multiple timepoints, to understand how precise the readings are.<sup>189 193 194</sup> A range of repeat interval times were used, including 15 days<sup>194</sup> and four weeks.<sup>193</sup> Four studies, including two of those that looked at intra-observer reliability, also assessed inter-observer reliability.<sup>187 189 190 194</sup> In these analyses, researchers were seeking to understand agreement between different people looking at the same image. These studies typically compared agreement of images viewed on WhatsApp versus a routine image platform, such as a PACS machine. The most common measure of reliability in these studies was the kappa statistic, including Cohen's <sup>193 190 189</sup>, and Fleiss' <sup>194</sup> kappa. The Shapiro-Wilk test was also used in one instance.<sup>187</sup>

*Theme two: The impact of WhatsApp consultations on time to care*

Methodologies for studies falling under the second theme, the impact of social media on time-to-care and length of stay, were much more varied. In four of these studies, historical data was used to assess the potential impacts of WhatsApp on facility time metrics.<sup>188 192</sup>

<sup>184 185</sup> Retrospective chart reviews were used in three of these instances.<sup>192 184 185</sup> In two

of the retrospective chart reviews, patient medical records were reviewed to identify patients that did and did not receive emergency consultations via WhatsApp.<sup>192 184</sup> These groups were then compared to evaluate if there were substantial changes in metrics such as length of stay and admission requirements. The Pearson's Chi square and Fischer's exact tests were used to identify differences, depending on sample sizes available. The third retrospective chart review was simply descriptive and did not provide a comparator group without WhatsApp consultation.<sup>185</sup>

In Sabırlı et al.'s retrospective case-control study,<sup>188</sup> patients were naturally assigned to either case (WhatsApp video consultation) or control groups (bedside consultation) groups based simply on consultant availability, with no intentional treatment allocation. Differences in time to admission and EU length of stay were then evaluated using the Kolmogorov-Smirnov and Mann-Whitney U tests, for those meeting and not meeting parametric assumptions of normality, respectively.

Alhejily conducted the review's sole prospective chart review.<sup>186</sup> A new clinical pathway for chest pain patients with likely STEMI, included real-time WhatsApp consultation and feedback on care from a specialist, was tested to determine if it reduced door-to- ECG and door-to-balloon procedure times. Time metrics were collected both before and following protocol implementation, and paired t-testing was used to quantify the impacts of the protocol on STEMI patient care. The only other prospective study was conducted by Gulacti and Lok.<sup>183</sup> This study was unique in that it was the only randomised clinical trial identified by this review. The study team randomly assigned all EU patients requiring consultations into two groups, one of which received telephone-based verbal consultations and the other receiving WhatsApp consultations. The WhatsApp

consultations could not include verbal communication, and only images, videos, and text messages were permitted. In addition to descriptive statistics within and across the groups, the Mann-Whitney U test was used to compare EU length of stay and consultation time across the traditional and WhatsApp treatment groups.

Finally, a single nondirectional study fell under this theme: Ganasegeran et al.'s cross-sectional survey assessing why and how WhatsApp may be impacting time-to-care and patient outcomes in Malaysian EUs.<sup>191</sup> This study involved a questionnaire that evaluated the perceived benefits of WhatsApp use by healthcare providers, and Chi square tests were used to identify differences in perception among types of providers.

Additional information regarding study methodologies and data analysis plans can be found in Table 2.5.

**Table 2.5:** Methodological overview of included studies

Article	Study design	Methods	Sampling strategy	Statistical analysis
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>				
Devrim et al. 2019 <sup>190</sup>	Retrospective imaging review	Children admitted to a Turkish EU with rash that had onset within last 12 hours had two images taken of the rash on a smartphone. Images were shared with the infectious disease consultant via WhatsApp, and clinical details were shared verbally with the consultant via telephone. The initial diagnosis by the infectious disease consultant, which was made remotely using only the images and verbal explanation, was recorded and compared to a final diagnosis made later on by an on-site consultant who performed an in-person physical exam.	Non-probability sampling (i.e., all patients meeting criteria were included)	Descriptive characteristics of included patients were presented in the form of frequencies and quartiles. Cohen's kappa was used to determine agreement between the remote and on-site consultant diagnoses.
Giordano et al., 2014 <sup>194</sup>	Retrospective imaging review	Plain radiographs and CT scans taken upon presentation to the EU were obtained from medical records and sent to six observers (orthopaedic surgeons) via WhatsApp. Observers were asked to determine the type of injury and standard deviation, classifications according to the Schatzker and Luo classification schemes, and whether reviewing the CT scan changed their classifications. Observers assessed the images on WhatsApp twice, 15 days apart.	Non-probability sampling (i.e., all patients meeting criteria were included)	Inter- and intra-observer agreement was estimated using Fleiss' kappa statistic for participants during the two-round evaluation. Classifications based on the Schatzker and Luo schemes were compared with the gold standard (considered to be unanimous agreement) after each round of evaluation. The Chi-square non-parametric test was used to assess correlations between participant responses and the gold standard.

Article	Study design	Methods	Sampling strategy	Statistical analysis
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>				
Inan et al., 2020 <sup>187</sup>	Retrospective imaging review	Cranial CT images in each patient's record were video-recorded by an emergency physician using a smartphone. The images were sent via WhatsApp to two radiologists. The original CT images were reviewed by two additional radiologists at the PACS workstation (as is standard practice). Final diagnoses were compared for various types of lesions to evaluate the inter-observer agreement and diagnostic success of WhatsApp consultation vs. traditional PACS review.	Non-probability sampling (i.e., all patients meeting criteria were included)	Seeking to determine differences in diagnostic capabilities of WhatsApp vs. PACS. Distribution of data: Shapiro-Wilk test Intraobserver agreement: Cohen's kappa. Additional measures of accuracy and agreement: sensitivity, specificity, negative predictive value, positive predictive value, and accuracy
Kapıcıoğlu et al. 2019 <sup>189</sup>	Retrospective imaging review	Radiology images were captured and sent to three orthopaedic surgeons via WhatsApp for review. To calculate inter and intra-observer reliability, three observers were asked to review the images again at a later date on a PACS machine.	Non-probability sampling (i.e., all patients meeting criteria were included)	Kappa correlation coefficient (k) was used to indicate intra- and interobserver reliability
Stahl et al., 2017 <sup>193</sup>	Retrospective imaging review	CT scans were captured by video taken on a smartphone from a computer screen displaying PACS and sent to the personal smartphones of five spine surgeons. Evaluators were asked to diagnose, classify, and determine the course of treatment for each case based on the videos of the CT scans. Evaluation of cases was repeated at four weeks using the standard method of workstation-based PACS.	Non-probability sampling (i.e., all patients meeting criteria were included)	Cohen's kappa statistic was used to assess intra-observer agreement.



Article	Study design	Methods	Sampling strategy	Statistical analysis
<i>Theme two: The impact of WhatsApp consultations on time to care</i>				
Alhejily, 2021 <sup>186</sup>	Prospective chart review	A new clinical pathway for chest pain was established, which included both clinical care guidelines and a protocol for real-time WhatsApp-based feedback on care. Data were collected for three months pre-implementation and six months post-implementation.	Non-probability sampling (i.e., all patients meeting criteria were included)	Paired t testing was conducted to evaluate changes in time-to-ECG and time-to-balloon before and after implementation of the protocol.
Ganaseg-eran et al., 2017 <sup>191</sup>	Cross-sectional survey	A survey was distributed to assess how and why WhatsApp was being used in clinical practice in Malaysian EUs.	Non-probability sampling	Normality testing was done for all quantitative data. Chi squared tests were used to determine associations between categorical variables and perceived benefits of clinical WhatsApp usage. Multiple logistic regression using the Backward Wald technique was used to identify predictors associated with perceived benefits of WhatsApp use in clinical practice. All covariates with significant associations in bivariate analysis were included in the multivariate analysis. Standard errors were used to identify potential multi-collinearity between variables.

Article	Study design	Methods	Sampling strategy	Statistical analysis
<i>Theme two: The impact of WhatsApp consultations on time to care</i>				
Gulacti & Lok, 2017 <sup>183</sup>	Prospective randomised controlled trial	EU consultations were allocated into two groups - those requested via WhatsApp and those completed verbally via telephone - and treatment allocations were assigned randomly by a computer model. Patients and providers were blinded to the purpose of the study and allocations. No verbal communication was used in communicating with consultants in the WhatsApp group; only messaging and image sharing were allowed.	Non-probability sampling (i.e., all patients meeting criteria were included)	Numeric data were expressed descriptively using means and standard deviations or medians and interquartile ranges (IQRs), and categorical data were expressed as rates. The Kolmogorov–Smirnov test was used to assess normality of continuous variables. The Mann-Whitney U test was used to compare data that did not conform to a normal distribution.
Gulacti, Lok & Çelik, 2016 <sup>185</sup>	Retrospective chart review	Medical records and WhatsApp messages were analysed for all included patients.	Non-probability sampling (i.e., all patients meeting criteria were included)	Descriptive characteristics were analysed.
Gulacti et al., 2016 <sup>184</sup>	Retrospective chart review	Clinical (e.g., patient demographics, chief complaints, diagnoses, images, and laboratory results) and administrative data (e.g., consultation date and time) were obtained from WhatsApp message histories and hospital medical records.	Non-probability sampling (i.e., all patients meeting criteria were included)	Numeric data were expressed descriptively using means and standard deviations or medians and IQRs, and categorical data were expressed as rates. Pearson's Chi square or Fisher's exact tests were used to analyse consultation frequency and the relationship between clinics requesting consultation and termination of consultation.
Article	Study design	Methods	Sampling strategy	Statistical analysis

*Theme two: The impact of WhatsApp consultations on time to care*

Martinez et al., 2017 192	Retrospective chart review	All WhatsApp consultations received by the burn centre's two senior physicians over an 18-month period were reviewed. The origin and purpose of each message (advice for treatment, transfer, or follow-up) were assessed. Information was also collected on the patient, including demographics, and mechanism and extent of burn injury. Impacts of WhatsApp consultations on admission and return visits was assessed, as were impacts on costs of patient care.	Non-probability sampling (i.e., all patients meeting criteria were included)	A descriptive analysis was conducted on a random sample of 300 included cases to determine the mean number of WhatsApp interactions per patient and time required to complete the consultation. Analytical analysis was conducted to determine if there was a significant reduction in the number of clinic visits, admissions or surgeries during the intervention period when compared with data for patients that did not receive WhatsApp consultations in the previous five years. No specific analytical tests were noted, but significance was said to be determined as $p < 0.05$ .
Sabırlı et al., 2020 188	Retrospective case-control	Patients were naturally assigned to case (WhatsApp video consultation) and control (bedside consultation) groups based on consultant availability, with no intentional treatment allocation.	Non-probability sampling (i.e., all patients meeting criteria were included)	Differences in time to admission and EU length of stay were evaluated using the Kolmogorov-Smirnov and Mann-Whitney U tests, for those meeting and not meeting parametric assumptions of normality, respectively.

### 2.5.5 Key findings from of included studies

#### *Theme one: The diagnostic power of images transmitted via WhatsApp*

A total of five studies used intra- and/or inter-observer reliability to assess the diagnostic power of WhatsApp. Overall, results were extremely similar, suggesting strong diagnostic power when viewing images on small smartphone screens, even in comparison to large PACS machines. These studies were assessed using kappa values, which denote agreement levels. These values are typically grouped into ranges: 0.21–0.40 is considered fair agreement, 0.41– 0.60 is moderate agreement, 0.61–0.80 is substantial agreement, and 0.81 to 1.0 is near-perfect agreement.<sup>195</sup> Values lower than 0.21 may indicate that agreement does not exist.

Three studies reviewed the reliability of CT scans sent via WhatsApp.<sup>187 193 194</sup> These studies found largely substantial intra-observer reliability, with kappa values ranging from 0.67 and 1.0 when providers reviewed the same image at multiple time points. When multiple providers reviewed the same image, inter-observer agreement was strong but had more variation; kappa values ranged from 0.45 to 1.0 but tended to be around 0.80 which is considered substantial. Two studies evaluated inter- and intra-observer reliability of x-rays sent via WhatsApp to orthopaedic consultants.<sup>189 194</sup> Similar to the findings in CT scans, reliability was strong. Both studies found that intra-observer reliability of orthopaedic x-rays was high, ranging from 0.74 to 1.0. Inter-observer reliability was again similar to CT scan results, with kappa values between 0.67 and 1.0. Rashes had the strongest inter-observer reliability when shared on WhatsApp, with a near-perfect kappa of 0.994.<sup>190</sup>

Across all imaging types, kappa results were significant, suggesting that there is no difference in imaging diagnoses made in-person on larger screens versus on smaller smartphone screens. They concluded that WhatsApp does not appear to meaningfully reduce the quality of radiographs, CT scans, and other pictures, and that providers can effectively view images on smartphones. These studies provided substantial evidence that WhatsApp is an effective means of sharing images required for consultation. Despite these strong findings, nearly all of these articles called for additional research prior to widespread expansion of this practice.

*Theme two: The impact of WhatsApp consultations on time to care*

The impact of WhatsApp on time to care was evaluated in seven studies identified by this scoping review. Overall, the results of these publications suggest that WhatsApp has significant impacts on patient care.

In many cases, times to consultations and definitive care were significantly reduced. For example, Alhejily, who studied the impact of a chest pain protocol incorporating real-time specialist feedback via WhatsApp, found that the protocol reduced door-to-balloon time significantly: 92% of patients received balloon treatment in under 90 minutes, compared to 77% in the pre-implementation period ( $p = 0.001$ ).<sup>186</sup> Additionally, 93% of patients with chest pain received an ECG within 10 minutes of arrival following protocol implementation, compared to 76% pre-implementation ( $p=0.0001$ ). While patient outcomes were not studied directly in this work, these times to procedures are considered proxy measures of patient outcomes for those with chest pain; this suggests that the WhatsApp protocol likely had real, positive impacts on patient outcomes.

In Turkey, Gulacti and colleagues further developed the evidence base for the use of social media in emergency care, establishing its convenience and impacts on time to care. The group conducted two studies in 2016 to assess the impacts of WhatsApp consultations on orthopaedic injury outcomes.<sup>184 185</sup> Both studies evaluated medical records and historical WhatsApp messages to understand how and why consultations occurred. They found that orthopaedic specialists had quick median response times to WhatsApp messages, averaging just 4.9 minutes (range: 1-59 minutes).<sup>185</sup> Nearly all consultations were successfully resolved via WhatsApp, with only one-quarter of cases requiring a follow-up visit in-person in the EU.<sup>184 185</sup> They established that WhatsApp consultations were far more common on overnight shifts, when providers were not physically present on facility grounds<sup>184</sup>: Most (n=126, 65.4%) consultations were conducted by consultants not physically present on hospital grounds and 80.2% (n=101) were conducted during overnight shifts.<sup>185</sup> Nearly all orthopaedic consultations occurring on WhatsApp contained photographic images and text messages (n=517, 99.6 %), and videos (n=59, 11.3%) and voice messages (n=10, 1.9%) were less common.

In 2017, Gulacti and Lok went on to conduct a randomised controlled trial, a type of study that generates what is considered the “gold standard” of evidence and typically has results that imply causation.<sup>183 196</sup> By randomly assigning patients to WhatsApp and standard telephone consultation groups, they were able to show that median EU stays are shorter when WhatsApp consultation is used, at 240 minutes (95% confidence interval: 240 to 255.2) versus 277 minutes (95% confidence interval: 277 to 279) in the telephone group. The shorter EU stays were likely due to faster consultations: Times to consult were significantly lower in the WhatsApp group, taking a median 158 minutes compared to 170 minutes in the telephone group. The median difference between groups

was -12 minutes (95% confidence interval -19 to -7,  $p<0.0001$ ), meaning that WhatsApp group patients tended to wait 12 fewer minutes for an emergency consultation. This study also showed that, when WhatsApp was used for remote consultation instead of telephone, there was a reduced need for in-person consultation.

Sabırlı et al. also established the benefits of WhatsApp consultations on patient outcomes, finding that WhatsApp consultations produced significantly better outcomes than traditional in-person and telephone consults.<sup>188</sup> EU lengths of stay were shorter, on average, for both admitted and discharged patients that received WhatsApp consultation. For patients that were ultimately discharged, their stays were significantly shorter at a median 103 minutes compared to the bedside group's 196 minutes ( $p<0.001$ ). Median EU stays were also shorter for those who received WhatsApp consultation and were admitted, at 116.5 minutes versus 132 minutes for those in the bedside group ( $p=0.04$ ).

The work of Martinez et al. further evidenced the benefits of WhatsApp consultation over telephonic consultations.<sup>192</sup> Across WhatsApp consultations for 838 patients, with burn centre specialists for paediatric burns presenting to EUs reduced both unnecessary referrals and outpatient visits. WhatsApp consultations generated no significant changes in the number of surgical interventions or hospital admissions. Significant reductions were, however, seen in outpatient visits in the WhatsApp consultation group.

Finally, Ganasegeran et al. provided context on how providers perceive the benefits of WhatsApp use in emergency care settings.<sup>191</sup> More than two-thirds (68.4%) of the 324 healthcare providers surveyed perceived WhatsApp use as a benefit to clinical practice, noting beliefs that it improved both time to care and patient outcomes. Perceived benefits

were significantly higher in the clinical management group (i.e., physician leadership) and those who had been using WhatsApp for more than 12 months. This study also established that this application was used frequently in a number of point-of-care settings, including during rounds, procedures, and on calls.

Further details on study outcomes and key conclusions are described in Table 2.6.



**Table 2.6:** Overview of key findings from included studies

Article	Key results	Key conclusions
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>		
Devrim et al. 2019 <sup>190</sup>	The initial diagnosis, which was performed via WhatsApp on a smartphone, was identical to the final diagnosis by an on-site consultant in nearly all (96.3%) cases. Agreement between the remote and on-site consultants was almost perfect, with a kappa of 0.994 ( $p < 0.005$ ).	In this first-ever study of smartphone application use to diagnose paediatric rashes, it was shown that WhatsApp can allow for accurate diagnosis in cases when an on-site infectious disease specialist is not available. Our study has shown that the use of a smartphone-based instant messaging application for transmitting images of paediatric rash is accurate and useful for diagnosis. However, physical examination and medical history are still the primary methods. Consultation via smartphones in emergency departments for paediatric rashes during nightshifts would help both clinicians and patients.
Giordano et al., 2014 <sup>194</sup>	Inter- and intra-observer agreement ranged between excellent and perfect ( $0.75 < k < 1.0$ ) across all survey questions and both evaluation rounds, spaced 15 days apart.	This study confirmed its initial hypothesis that WhatsApp does not reduce the quality of orthopaedic radiographs and CT scans and allows for sufficient detail to accurately diagnosis and classify fractures.

Article	Key results	Key conclusions
<i>Theme one: The diagnostic power of images transmitted via WhatsApp</i>		
Inan et al., 2020 <sup>187</sup>	In the assessment of the interobserver agreement, the kappa values were found to be 0.89 for normal findings, 0.84 for subdural hematoma, 0.73 for subarachnoid haemorrhage, 0.81 for epidural hematoma, 0.85 for fractures, 1 for parenchymal hematoma, and 0.68 for parenchymal contusion.	In conclusion, although WhatsApp can be used in the evaluation of emergency cranial CT images, it is essential to note that some findings, especially those indicating fractures, subdural hematoma, and parenchymal contusion, can be overlooked. Although WhatsApp was found to have approximately 80% sensitivity in detecting normal cranial CT findings in emergency cases, but it should be kept in mind that pathological findings may be present in the remaining 20%.
Kapıcıoğlu et al. 2019 <sup>189</sup>	Agreement amongst physicians reviewing elbow trauma images via WhatsApp was high ( $k=0.74$ ). Intraobserver reliability varied but was generally good ( $k=0.67$ ). There were no significant differences in intra- and interobserver reliability in the WhatsApp and PACS groups.	WhatsApp is a reliable method for reviewing elbow trauma images in real-time to inform emergency care. Furthermore, it can improve the effectiveness of medical assessment and reduce waiting times.
Stahl et al., 2017 <sup>193</sup>	The intraobserver agreement for determining fracture level was near perfect ( $\kappa=0.94$ ). Intraobserver agreement for AO classification, proposed treatment, neural canal penetration, and Denis classification were substantial ( $\kappa$ values, 0.75, 0.73, 0.71, and 0.69, respectively). Intraobserver agreement for loss of vertebral height and kyphosis were moderate ( $\kappa$ values, 0.55 and 0.45, respectively)	Diagnosing, classifying, and proposing treatment plans for thoracic and lumbar spine fractures can be done with equal reliability by evaluating video clips of CT scans transmitted via WhatsApp or of viewing the CT scan on a workstation-based PACS.

Article	Key results	Key conclusions
<i>Theme two: The impact of WhatsApp consultations on time to care</i>		
Alhejily, 2021 186	At six months post-implementation, door-to-balloon time decreased significantly: 92% of patients received balloon treatment in under 90 minutes, compared to 77% in the pre-implementation period ( $p = 0.001$ ). 93% of patients with chest pain received an ECG within 10 minutes of arrival following protocol implementation, compared to 76% pre-implementation ( $p=0.0001$ ).	The use of a clinical pathway for chest pain patients, in addition to real-time feedback on care via WhatsApp, significantly improved performance on key indicators related to acute coronary syndrome patients, including door-to-first-ECG and door-to-balloon time.
Ganasegeran et al., 2017 191	More than two-thirds (68.4%) of respondents perceived WhatsApp use as beneficial to clinical practice. Perceived benefits were significantly higher in the clinical management group (i.e., physician leadership) and those who had been using WhatsApp for >12 months. The application was used frequently in a variety of settings, including during rounds, procedures, and on calls.	WhatsApp was broadly seen as an important component of clinical care and professional management in EUs and other clinic settings. The majority of clinicians included in this study saw benefit in using WhatsApp in clinical settings; however, a large minority did not.

Article	Key results	Key conclusions
<i>Theme two: The impact of WhatsApp consultations on time to care</i>		
Gulacti & Lok, 2017 <sup>183</sup>	<p>A total of 345 patients were included, with 173 patients allocated to the WhatsApp consultation group and 172 patients to the traditional telephone group. Median EU stay was shorter for the WhatsApp group, at 240 minutes (95% confidence interval: 240 to 255.2) versus 277 minutes (95% confidence interval: 277 to 279) in the telephone group. Median EU length of stay was lower for WhatsApp patients, with a median difference of -30 minutes (95% confidence interval: -37 to -25, <math>p &lt; 0.0001</math>). Consultation times were significantly shorter in the WhatsApp group, taking a median 158 minutes compared to 170 minutes in the telephone group; the median difference between groups was -12 minutes (95% confidence interval -19 to -7, <math>p &lt; 0.0001</math>).</p>	<p>Using WhatsApp consultations in the EU reduces the total EU length of stay and consultation time and eliminated more than half of in-person EU consultations.</p>
Gulacti, Lok & Çelik, 2016 <sup>185</sup>	<p>Of the 686 WhatsApp messages sent to the orthopaedic consultants for included patients, one-third (<math>n=221</math>, 32.2%) were photographs of x-rays, 190 (27.7%) were text messages, and 178 (25.9%) were photographs of injuries or lab results. Median response time of orthopaedic consultants to WhatsApp messages was 4.9 minutes (range: 1-59 minutes). Three-quarters (<math>n=143</math>, 74.5%) of consultations were successfully concluded via only WhatsApp; in the remaining 25.5% of cases (<math>n=49</math>), the consultant ultimately needed to come to the EU. Most (<math>n=126</math>, 65.4%) consultations were conducted by consultants not physically present on hospital grounds and 80.2% (<math>n=101</math>) were conducted during overnight shifts.</p>	<p>This study suggests that WhatsApp is a practical and commonly-used communication tool between physicians, especially for EU consultants who are outside the hospital at the time of a necessary consultation.</p>

Article	Key results	Key conclusions
<i>Theme two: The impact of WhatsApp consultations on time to care</i>		
Gulacti et al., 2016 <sup>184</sup>	Nearly all consultations (n=510, 98.3 %) contained photographic images and text messages (n=517, 99.6 %). Videos (n=59, 11.3%) and voice messages (n=10, 1.9%) were less common. Orthopaedists were most frequently consulted (n=160, 30.8%). Most consulting physicians were not physically present on hospital grounds at the time of consultation (n=292, 56.3%); this was higher at night than during the day. The majority of outside consultation requests were completed via WhatsApp only, with no need for telephonic consultation or an in-person visit.	This study suggests that WhatsApp is a practical and commonly-used communication tool between physicians, especially for EU consultants who are outside the hospital at the time of a necessary consultation.
Martinez et al., 2017 <sup>192</sup>	Across communications for 838 patients, providers at EUS communicated 1,562 distinct clinical queries to burn specialists. Questions were related to initial emergency burn care, triage, transfers surgical interventions, and follow-up planning. WhatsApp consultations generated no significant changes in the number of surgical interventions or hospital admissions. Significant reductions were, however, seen in outpatient visits in the WhatsApp consultation group.	WhatsApp consultations with burn centre specialists for paediatric burns presenting to EUs reduced both unnecessary referrals and outpatient visits. In regions where specialists and burn centres are limited, WhatsApp should be considered for consultations to improve burn care and patient outcomes.
Sabırlı et al., 2020 <sup>188</sup>	The median EU length of stay was found to be significantly shorter for both admitted and discharged patients in the WhatsApp group. For patients that were ultimately discharged, their stays were significantly shorter at a median 103 minutes compared to the bedside group's 196 minutes (p<0.001). Median EU stays were also shorter for those who received WhatsApp consultation and were admitted, at 116.5 minutes versus 132 minutes for those in the bedside group (p=0.04).	WhatsApp video consultations reduced lengths of stay for both admitted and discharged patients with COVID-19.

## **2.6 Discussion**

### **2.6.1 Overview of included studies**

This scoping review successfully analysed the evidence base for point-of-care use of social media in facility-based emergency care settings. It identified that the existing data are substantial but limited and highlighted numerous areas for additional research. Ultimately, despite a global literature search strategy that included numerous terms related to social media and emergency care, just 12 studies met inclusion criteria and were analysed for this study. Given the infancy of social media's use in medicine and the risks of its use in healthcare, this small group of findings is unsurprising.

What is surprising, however, is that all of the included studies only evaluated one social media platform as a point-of-care tool: WhatsApp. This result was unexpected. It is logical that the social media applications used for point-of-care communications would have some element of privacy, such as encrypted messaging, and private direct messaging or channels to send messages. It was expected that a free application that works across all types of smartphones and computers would likely be most common.<sup>25</sup> But, while WhatsApp has nearly one billion daily users worldwide,<sup>25</sup> numerous other platforms, such as Facebook Messenger and Telegram, have similar features and could conceivably be used in the same fashion. This finding suggests that there is a clear preference for, and ubiquity of use of, WhatsApp by healthcare providers.

Included studies had limited geographical reach, with more than half coming from Turkey and nearly all from upper-middle-income countries. Turkey was extremely overrepresented in this scoping review, generating seven of the 12 included studies. This was unanticipated, but suggests that the country as a whole and, specifically, Gulacti and

colleagues, are extremely invested in understanding how to improve patient outcomes using a free messaging application.

In many high-income countries, EHRs have been introduced. In addition to traditional record-keeping functions, these systems also typically have built-in messaging platforms. The most advanced EHRs have secure applications that providers can log into on their personal smartphones.<sup>197</sup> Given that these applications are not considered “social media,” such use in HICs was not picked up on in this review. No studies were identified in LICs or lower-middle income countries. This is surprising. Given that healthcare resources, including providers themselves, are strained in LIC settings, it is likely that social media platforms are being used to leverage consultations and other point-of-care needs. What is likely limiting LICs from being represented in this scoping review’s findings is, therefore, not actual use but research documenting this use. Although research capacity is growing in LICs, it is still extremely limited.<sup>198</sup> These countries are challenged by the high costs of research, infrastructure required to implement studies, and the manpower needed to complete them. Many of these countries also face political unrest and extended conflicts, both of which prevent research studies from being completed.<sup>199</sup>

This search extended its publication start date back to 2010 and it is possible that, had an article been identified that was published in that year, data collection would have occurred in 2009 or earlier. Yet, publication dates did not precede 2014 and all studies’ data collection periods occurred within the last ten years. This highlights the newness of applying social media in healthcare.<sup>104</sup> Furthermore, the fact that most of the studies occurred in the last five years shows that interest in studying its use is accelerating. The phenomenon of increasing social media use is well documented in the contexts of patient

and provider education, particularly during the coronavirus pandemic;<sup>200 201</sup> however, there is no large-scale evidence available to support increases in use in point-of-care settings.

### **2.6.2 Aims and key themes of included studies**

Emergency care encompasses a wide range of life-threatening injuries and illnesses. Therefore, it was expected that the studies identified by this scoping review would relate to a variety of clinical conditions. This was, indeed, the case: Many studies looked at the impacts of trauma, including burns, head injuries, and orthopaedic problems such as bone fractures. Other studies evaluated WhatsApp's impacts on infectious disease care for patients with conditions such as nonspecific rashes and COVID-19. The breadth of clinical topics found in this review suggests that WhatsApp – and likely other social media platforms – are being used in emergency settings for nearly all types of injuries and illnesses.

In line with established research, most studies targeted adult patients presenting with emergency conditions and excluded children under 18 years of age.<sup>202</sup> Adults tend to be more commonly researched because consent and other ethical issues are less problematic. But, despite of the fact that paediatric research is far less common than that in adult populations, paediatric patients were remarkably well-represented in this review.<sup>203</sup> Such a finding is extremely promising. Children are often challenging to treat, and those in lower-resourced settings may have limited access to the education and consultation needed to adequately care for paediatric emergencies.<sup>204</sup>



For the purposes of a narrative analysis, two themes were identified within the identified texts: 1) the diagnostic power of images transmitted via WhatsApp, and 2) the impact of WhatsApp consultations on time to care.

Preliminary research on the review question during protocol development had suggested that most studies would focus on the impacts of social media on patient outcomes. That nearly half of included studies focussed specifically on the diagnostic power of a single platform was not anticipated. In many healthcare settings, especially those in LRS, there are a limited number of specialists on staff, and many have the seniority to be off grounds on nights and weekends. Prior to the publication of the included diagnostic studies, it was unknown whether electronic messaging and review of images on small smartphone screens would have any impacts on patient diagnoses or care. Use of WhatsApp or a similar platform allows specialists to provide consultations without needing to be physically present at a healthcare facility. It is likely that this flexibility, in combination with staffing specialist issues, motivated many of the diagnostic studies.

Greater variety was seen in the studies included in theme covering the impacts of WhatsApp on consultations. These studies went beyond assessing diagnostic capacity and looked at larger system metrics, such as time to receiving specific procedures and length of stay. Generally, these studies appeared to be motivated by the promise of potential time and cost savings, as well as improved patient outcomes. No LIC countries were represented in these studies, but one study on paediatric burns in South Africa did emphasise the importance of cost- and time-savings in LRS.

Interestingly, across both the diagnostic and effectiveness themes, no studies appeared motivated by the hazards that social media use poses to patient privacy.<sup>205</sup> This was surprising, as the potential ethical and security-related risks are well-documented in the medical literature.<sup>71 110 112</sup> Studies may not have wanted to draw attention to these risks, so as to put their research in danger, and may have instead chosen to focus on the benefits in their rationales.

### **2.6.3 Methodology of included studies**

Although methodology and data analysis within included studies varied, some overarching conclusions can be drawn. The majority of studies were conducted retrospectively, meaning that existing data were used to inform the research question at hand. Unfortunately, retrospective study designs limit the significance of their findings, as data were not purposefully collected for the study and some charts may be missing certain images or other datapoints. Furthermore, in these studies, participants cannot be randomly assigned to treatment and control groups. Even in instances where a case-control methodology is used, such as how Sabırlı et al. identified case that had WhatsApp video consultation and controls with bedside consultation,<sup>188</sup> there can be bias in the non-random assignment of these treatments. Therefore, even if findings are found to be statistically significant, they may not be wholly representative of real-life effectiveness.

Prospective studies are a great tool to reduce the bias of treatment assignments, because it allows for intentionally-random placement into case and control groups within the study. Only two prospective studies were identified by this scoping review. One evaluated the impacts of a new WhatsApp intervention on time to care for STEMI patients.<sup>186</sup> The study remains limited, though, because patients were only prospectively assigned into the

treatment group that received the new chest pain protocol's standard of care. This prospective cohort was ultimately compared to previous years' data when patients were treated with a traditional chest pain protocol. The lack of random assignment means that there is likely selection bias limiting this study's results. Just one study represented the "gold standard" of research studies: Gulacti and Lok's randomised controlled trial to assess WhatsApp versus telephonic consultations for adult patients presenting to Turkish EUs.<sup>183</sup> This study's methodology defined a protocol for randomly assigning patients to receive either the traditional telephonic consultation or a messaging-only WhatsApp consultation. This prospective, intentionally-random assignment allows reduces bias and allows for examination of cause-and-effect relationships between the consultation intervention and patient outcomes.<sup>196</sup>

Methodology used in studies falling under theme one – the diagnostic power of images transmitted via WhatsApp – was extremely consistent. Regardless of the type of image being viewed, all studies assessed inter- and/or intra-rater reliability. Some variation was noted in how normality of data was assessed and what versions of kappa coefficients were used, but this is expected because of variations in the base populations and sample sizes. Interpretation of kappa values, which indicate the level of agreement between reviews, did vary, with authors using different ranges to denote different levels of agreement (e.g., what constitutes "near perfect" versus "excellent" versus "moderate" agreements). For the purposes of this study's narrative analysis, a singular scale was used to describe kappa values across all studies.<sup>195</sup>

The methods used to assess the impact of WhatsApp consultations on patient care metrics – considered "theme two" of this study – were far more variable. A few, such as

Alhejily's chart review and Gulacti and Lok's randomised controlled trial,<sup>183 186</sup> were prospective studies, while most relied on existing data to conduct retrospective analyses.<sup>188 192 184 185</sup> Most of the aforementioned studies provided descriptive statistics, analysed the data for normality, and then conducted tests to determine the effectiveness of WhatsApp consultations compared to more traditional consults. The specific statistical analyses used for these studies did, however, vary. This is likely due to differences in sample size, as well as the specific outcome that each study was evaluating.

Only one study described the use of a cross-sectional survey, which provided some limited insights into how emergency care providers perceive social media.<sup>191</sup> This study was limited in its scope, as it only reached a small number of EUs and medical clinics that provide emergency care in Malaysia. Furthermore, it was restricted to descriptions of WhatsApp use, and no other social media platforms were described.

#### **2.6.4 Key findings from included studies**

Broadly speaking, the findings of studies included in this scoping review suggest that social media messaging platforms, and particularly WhatsApp, have great promise in improving facility-based emergency care.

The diagnostic studies served largely to address existing concerns that sharing information via messaging to small-screened smartphones may lead to lesser image quality. It was thought that this, in turn, could impact the effectiveness of reviews and limit diagnoses, especially in cases of small pathologies or injuries. These fears, however, were proven unfounded: Across all five studies evaluating the diagnostic power of images shared on WhatsApp, there was no loss in diagnostic power. Specialists reviewing

images of CT scans, x-rays, and rashes could consistently and accurately diagnose pathologies on WhatsApp. Furthermore, there was no significant difference in the diagnostic power on WhatsApp compared to large-screened machines such as PACS.

This finding is extremely important when considering the use of social media for consultations, as images are one of the most common items transmitted to consultants. The fact that there is no loss in image integrity or diagnostic capacity suggests that remote diagnostics on smartphones are extremely viable. In settings like LICs, where clinicians may not have desktop computer access outside of their facility, being able to use their smartphones would greatly increase their capacity for patient care during off hours. These diagnostic studies highlighted that there was a great need for consultations by specialists that were technically off-grounds and “off duty,” even in the higher-income settings studied. LICs may be even more limited in their staffing, and there may only be one or two specialists in an entire province or region.<sup>206</sup> The utility of remote WhatsApp consultations is likely even greater in those settings.

Studies included in the second theme of this review, which looked at the impacts of WhatsApp consultations on time to care and other outcomes metrics, further the use case for WhatsApp and other social media platforms as a point-of-care tools. Results suggested that WhatsApp consultations have the power to reduce both EU and overall facility lengths of stay. These consultations seem to conclude more rapidly than telephonic consultations, and fewer in-person follow-up consultations are required when WhatsApp is used.<sup>183 185 188</sup> Time to specific procedures is also reduced when providers receive real-time guidance from specialists via WhatsApp, which can positively impact patient health outcomes.<sup>186</sup> Images are transferred more often than messages,<sup>184</sup> and

the visual component may be part of why WhatsApp consultations are more effective on. WhatsApp can clearly reduce both the cost and time associated with caring for emergency conditions, a fact that holds high value particularly in low-resource settings where both time and money are severely limited.<sup>192</sup>

This theme also included a study on the perceptions that healthcare providers hold regarding the use of WhatsApp in emergency care settings.<sup>191</sup> The survey, conducted by Ganasegeran and colleagues in Malaysia, suggested that the majority of providers feel that there are benefits to using WhatsApp, although a not insignificant number of participants noted that there are risks that must be addressed to ensure safety in its use. This survey is specific to WhatsApp use and only took place in a small number of facilities in a single upper-middle-income country. Additionally, its scope included, but did not focus solely on, point-of-care use of the application. It, however, important to note that this study is only study identified in this review that is similar to the survey on social media use in facility-based emergency care presented in Chapter 3.

## **2.7 Limitations**

There are several limitations that apply to nearly all scoping reviews, including this study. Scoping reviews are broad in nature, prioritising breadth over depth. These reviews typically cast a wide net to find any evidence that may relate to the review question, even if only tangentially. As such, findings are often wide-ranging, which can limit the synthesis and utility of a reviews results. In this review, a thematic approach was taken to divide findings into two categories and guide the descriptive narrative. Risk of bias is also a concern in scoping reviews, as quality assessment and critical appraisal are rarely undertaken. As suggested by Peters et al., this review provided in-depth descriptions of

all included studies' methodologies, to allow readers to gauge the quality of the content.<sup>176</sup>

The risk of publication bias also exists in scoping reviews: Nearly all findings from included studies shed positive light on the use of social media and a point-of-care tool, and there is the possibility that studies with negative or neutral findings were not shared. Studies may not be published when there is a risk to current practice, and negative studies on social media use in healthcare could generate pushback that researchers and providers do not want to encounter.

Additionally, there are limitations specific to this study's scoping review. First is that the findings of this study are quite small: Although nearly 4,000 texts were identified in the initial searches, just 12 were included following screening. This does suggest that the evidence base is quite limited and, in that context, motivates for further research. It must, however, also be considered a limitation. These studies were generally small in size, typically occurred at only one study site, and only one used the gold standard study methodology – a randomised clinical trial. All of these factors limit how generalisable and meaningful these findings are, regardless of findings of significance within individual studies. Therefore, no clinical scope of practice should be modified based on these studies alone.

Although this study had a broad search strategy – both inclusive of general social media terminology and several specific social media platforms – the only studies that met inclusion criteria focussed on WhatsApp. Furthermore, nearly all of these studies homed in on the impacts of real-time WhatsApp consultations on patient care. The extremely specific scope of this study's findings make it difficult to generalise results to other platforms, and even to other messaging applications. For example, a number of studies

evaluated image reviews on WhatsApp. Loss of image quality was a key motivator for these studies. Given that platforms process, encrypt, and share images via different internal methods, it is not possible to say that the apparent maintenance of image quality on WhatsApp is translatable to other applications. Nonetheless, this highlights an area of future study.

## **2.8 Conclusions and next steps**

This scoping review successfully analysed the landscape of existing literature related to the use of social media for point-of-care purposes in facility-based EM. The broad nature of the scoping review process allowed for an initial search, expansion of search terms based on preliminary findings, and an additional review of grey literature. The extraction process was used flexibly, with data points revised after piloting of an initial extraction tool. A narrative approach was taken to describe study methodologies and results, and this analysis identified strong but nascent evidence for the use of social media in facility emergency care. Two key themes emerged from studies meeting inclusion criteria, and these themes provided support for both the diagnostic power of imaging when transmitted via WhatsApp and the impact of the platform on consultations and care metrics.

It is clear that WhatsApp is of key interest to healthcare providers in moderately-resourced evidence, and future efforts to improve patient care should consider incorporating WhatsApp consultations in these settings. However, there is no doubt that other platforms are also being used, if informally, and additional research is essential to describe how those other applications are being leveraged. The positive results of these WhatsApp studies suggest other platforms are likely also effective in improving patient care, but this



assumption must be substantiated by sound research before platforms are formally integrated into care pathways.

This scoping review identified numerous gaps in the evidence base on social media use as a point-of-care tool in emergency care. Only a handful of studies were identified that met inclusion criteria, limiting the landscape analysis that this study sought to provide. This may be due in part to the inclusion criteria, including requirements that articles must be peer-reviewed full texts published in the English language. These criteria were essential to ensure the scientific rigor of the included evidence and to allow the researcher to analyse the texts without inconsistencies in translation. But they may have limited the inclusion of evidence that existed at the abstract level or in other languages. In LRS, many studies do not end up published in peer-reviewed journals, and these studies may have been missed.

This work found only small single-site studies describing WhatsApp use, and just one study provided insight into how emergency care providers perceive social media use. There was no evidence on the safety and security of real-time social media use in emergency care. Many studies were excluded from this review due to their lack of relevance to point-of-care medicine; these studies focussed instead on topics such as professional networking and education. Although those topics are beyond the scope of this dissertation, they are of great value and should be considered by other researchers studying social media in healthcare.

The noted gaps in evidence were used to inform and motivate the cross-sectional survey described in Chapter 3 of this dissertation. In order to inform a framework for social media

use in facility-base emergency care in LRS, it is essential that the survey conducted for this PhD cover the breadth of use of all social media applications be understood across an international setting.

## **Chapter 3: Survey-based assessment of the use of social media as a point-of-care tool by facility-based emergency care practitioners in Africa.**

### **3.1 Introduction**

Since its introduction less than two decades ago, modern social media use has grown exponentially. When Myspace reached one million active users in 2004, it was considered a major milestone for the concept of social media.<sup>4 9</sup> This milestone has been well-surpassed in the last 18 years. Today, over 4 billion people worldwide use social media at least once a week, and nearly 200 million new users have joined in 2022 alone.<sup>207</sup> Social media expanded first in HICs for two reasons: Internet connectivity and cellular technology were introduced earlier in these regions, and generally wealthier populations are able to afford more expensive technology. During recent years, the growth of new social media users in HICs has plateaued. In contrast, the new user base in LMICs continues to increase exponentially.<sup>207</sup> This growth has been facilitated by accelerations in access to wireless internet and mobile data, which are essential for devices to connect with one another.<sup>208</sup> Decreased costs of purchasing cell phones, tablets, and laptop computers have also allowed for increased social media presence worldwide.<sup>209</sup> The connectivity that social media provides to LMICs has had numerous benefits to these regions, including increasing incomes and engagement in electoral processes.<sup>210 211</sup> It is important to note, however, that this growth is concentrated in younger and more highly educated groups within LMICs.<sup>209</sup>

Social media use has infiltrated healthcare, where busy providers are in need of real-time information and methods for rapid communication.<sup>49</sup> The benefits to its use are many. Clinicians can connect with one another directly or in groups to advise on clinical cases.

In addition to traditional messaging, photo, video, and audio-sharing apps have changed how clinicians can share information.<sup>212</sup> They can also more easily communicate with the general public, improving health outcomes on a broader scale. Additional advantages for clinicians include real-time knowledge-sharing about unique cases, freely available continuing education, and professional networking.<sup>49 98</sup> Patients also benefit from social media, by way of improving access to healthcare information and educational resources and increasing accessibility to finding and obtaining healthcare.<sup>49 98</sup>

There are also many risks inherent to using social media for health purposes.<sup>64</sup> Primary concerns arise from the confidentiality expectations surrounding provider-patient relationships. In order to obtain advice on a case, healthcare providers must share sensitive information about a patient; this is also the case when providers use a patient case to educate colleagues. Regardless of the purpose, sharing this information poses risks to the patient, as the patient may be identified or their data may be breached by an unintended party.<sup>64</sup> Healthcare providers are expected to follow ethical codes in their patient encounters, but laws are often required to ensure that these interactions remain ethical.<sup>213</sup> While patient privacy laws exist in many parts of the world, explicit guidelines on social media use for patient care are limited.<sup>164</sup> A second prominent risk of social media use for health purposes is misinformation: Social media sites do not require evidence to support claims made in posts, and many users do not confirm the factuality of information before sharing.<sup>74 214</sup> These risks suggest that is imperative that social media use in healthcare is both well-studied and well-regulated.

Despite the potential benefits and risks of social media use in healthcare, to date, only one review has been published related to social media use for health-related purposes in

LMICs.<sup>75</sup> Across 31 research articles and nine case studies, a 2017 scoping review identified that social media was being used primarily for health education, along with management of infectious disease outbreaks and natural disasters. Twitter and Facebook were the primary platforms described in these studies, and no studies looked specifically at social media use by healthcare providers or in emergency care settings in LMICs.

### **3.2 Motivation**

It is clear that social media is being used in clinical settings to improve patient care, but a large volume of the evidence base supporting its use has been established in higher-income settings and fields outside of emergency care.<sup>49 75 100 75 215</sup> The scoping review conducted in Chapter 2 of this dissertation supports this, as it found no evidence of social media use for point-of-care emergency care in LICs. Furthermore, it identified only one study that describes emergency care provider perceptions of social media use in their practice, and this study was restricted to WhatsApp use.<sup>191</sup>

There is high likelihood that healthcare providers in LMICs, including those in emergency care, are leveraging social media for professional purposes. This hypothesis was supported by a short report from the International Federation for Emergency Medicine (IFEM) which, in 2020, surveyed its national emergency care groups to understand how IFEM can better connect with emergency care practitioners.<sup>216</sup> It found that most emergency care groups were using Facebook groups and Twitter posts to engage with their members, with YouTube also being used as a medium for information-sharing. IFEM itself found extremely high engagement on Facebook, particularly during COVID-19, when providers were in need of real-time information on providing emergency care in a pandemic setting.

The impacts of social media use in LRS healthcare settings are likely equal to, or greater than, those in higher-resourced settings. It is imperative that social media use be understood as it pertains to emergency care in LRS. However, prior to this study, no literature existed describing the use of social media by LMIC emergency care providers. Prior to a more in-depth interviews on social media use and the development of contextually-appropriate guidelines for social media use in LMICs, a comprehensive survey was needed.

### **3.3 Aim and objectives**

Study two aimed to broadly describe the use of social media as a point-of-care tool by emergency care practitioners in healthcare facilities in Africa.

It had the following objectives:

1. Describe the demographic characteristics of African emergency care practitioners that use social media as a point-of-care tool,
2. Quantify prevalence of use of various social media platforms by African emergency care practitioners,
3. Describe African emergency care practitioners' social media usage habits and practices, and
4. Understand African emergency care practitioners' attitudes towards use of social media in facility-based emergency care.

### **3.4 Methods**

#### **3.4.1 Study design**

A self-reported, cross-sectional survey was employed to describe user group demographics, prevalence of use, particular social media platforms used, and attitudes surrounding social media specifically as a point-of-care tool by African emergency care practitioners. A survey was selected as the optimal method to rapidly gather robust data from stakeholders across the vast African continent.

#### **3.4.2 Study population and sampling**

The target population for this study was facility-based emergency care practitioners working in Africa. To be eligible for inclusion in this study, participants were required to be physicians (e.g., those with MBChB or MD degrees) with an active clinical assignment to provide emergency care at a healthcare facility in a low- or middle-income African country. Specifically, physicians must have been actively providing clinical emergency care in such a setting for at least three months of the past year. Given that this study assessed the prevalence of use of social media in facility-based emergency care, participants were not required to use social media on any basis to participate. Participants were required to be at least 18 years of age and fluent in at least one of the following languages: English, Arabic, or French.

Purposive, non-probability recruitment was conducted to enrol participants in this study. Participants were identified via the African Federation for Emergency Medicine (AFEM) membership database. All members of the AFEM database were contacted via institutional email using AFEM's listserv infrastructure and asked to participate. AFEM is an international non-profit representing a broad coalition of organisations, national

societies, and individuals dedicated to the development of emergency care across Africa. As of 2020, AFEM had a membership base of approximately 1,000 individuals across more than 20 countries, all of whom agreed upon membership application to be contacted to participate in any research being conducted in compliance with South African privacy laws (AFEM is based out of Cape Town, South Africa). Membership is extended to nurses, prehospital providers, clinical officers, clinicians, and specialists working either full-time or part-time in emergency care or critical within an African setting. Per AFEM, an estimated 500 of these members will meet study inclusion criteria as active emergency care practitioners. Approximately 200 academic staff and postgraduate students from academic institutions offering African emergency care training within Africa were also contacted to participate using a secondary listserv.

There is extremely limited information describing prevalence of use of social media for communication in both LRS healthcare settings and EM. A recent study based in the United States suggested that between 60% and 80% of healthcare providers in a large healthcare system used social messaging platforms to discuss patient care in real-time.<sup>217</sup> Based on this, a conservative estimate was established that 60% of respondents will report use of social media as a point-of-care tool. At the level of  $\alpha = 0.05$  and 80% power, this yields a requisite sample size of 95 participants to conduct proportional comparisons. Accounting for some overlap between the two aforementioned listservs, we estimated a total of 600 eligible participants. A 2016 study using the AFEM database achieved a 34.8% response rate.<sup>218</sup> Assuming a similar rate in our study, a total of approximately 209 respondents was anticipated.



### **3.4.3 Survey development**

An electronic survey was developed to gather information on social media use in African emergency care, based on the findings of the previously-conducted scoping review (Appendices 3.1-3.3). A online electronic survey was ideal for this stage of the research, as it allowed for timely data gathering across a wide geographical region.<sup>219</sup> The survey was developed using established electronic survey methodologies,<sup>220 221</sup> with a focus on convenience and ease of response to ensure that as many participants as possible were captured. It was designed in SurveyMonkey (© SurveyMonkey Inc., Palo Alto, California, USA) and was created to be user-friendly on both desktop computers and mobile phones.

The survey was pilot tested amongst a group of four AFEM study team members. This pre-test focused on readability (on both mobile and desktop devices) and content, and the study team assisted in making modifications to the survey for clarity and to ensure all objectives were being met within the document.<sup>222</sup> The content was then validated by five African emergency care practitioners, who reviewed the survey and reported back on understanding, readability, and clarity of the questions posed. Based on responses, content validity (whether the question adequately represents the full range of the content being measured) and face validity (clarity and relevance of the question) were assessed. The study team then made changes to the provisional survey to include all reasonable suggestions. These changes were minors and included the removal of several potentially leading questions in the Likert scales and simplification of language. No further feedback was provided by the reviewer team following revisions.

The final version of the survey was translated into Arabic and French (Appendices 3.2 and 3.3), to improve response rates, as these are primary languages used in a number of African nations. Translated versions were piloted with two native language speakers per language, and refinements were made to ensure clarity in the translations.

#### **3.4.4 Survey components**

The final survey contained seven sections. The first section was an introduction that provided participants with information about the purpose of the survey, ethical approvals, and the study team. Consent to participate was also gathered in this section. Section two contained a single question, which confirmed that participants were involved in active clinical duties as a physician in an African emergency care setting, on a regular basis for at least three months of the last year.

Section three achieved objective one (describing the demographics of emergency care practitioners) by collecting information about respondent demographics, education, and experience using multiple choice and free text questions. Objectives two (establishing the prevalence of use of social media platforms) and three (describing habits of social media use) were met by the fourth section, which served to evaluate the respondent's current social media use, both personally and professionally. Participants were asked to list the social media platforms that they use in order of frequency and rate the frequency of use of these platforms. Although ample information exists on the prevalence of use of various social media platforms worldwide, no data were available to inform what applications may be most commonly used specifically for healthcare providers.<sup>16</sup> For this reason, examples of potential social media applications were not provided, and free-text responses were used instead.

Objective four (assessing attitudes towards social media use in clinical emergency care) was met in sections five through seven. Section five evaluated general attitudes surrounding social media use in clinical emergency care, using five Likert scale questions. Section six contained 10 Likert scale questions to assess how social media impacts the clinician, and section seven contained three Likert scale questions related to its perceived impacts on the patient. Likert scale questions were used when assessing attitudes and perceptions because these responses are likely nuanced and allow participants to reflect the specific degree to which they agree or disagree.<sup>223</sup> Five-point Likert scales were selected to allow for simplicity, particularly because the nuance of additional points (beyond five) may be difficult to interpret for those that are not native language speakers. There are also two binary (“yes/no”) questions in section seven pertaining to having received complaints or objections from patients regarding social media use.

The eighth section asked if the participant would be interested in a follow-up interview regarding their social media use and, if so, to provide an email address for contact.

Except for section one, which contained the consent question, responses to questions in all sections were marked as optional. Free-text questions were not utilised in this survey due to the challenges this question type can pose to non-native speakers; standardised responses also ensured clarity in analysis and limited the need for follow-up with participants.

### **3.4.5 Key definitions**

Key definitions adhered to in this study are described in Section 1.5.5, Key definitions. To maintain consistency in responses, the study's definition of social media was provided at the top of all sections of the survey.

### **3.4.6 Data collection and management**

Final surveys were uploaded to SurveyMonkey®, with unique links generated for each language version. A corresponding email was drafted, providing a short overview of the survey and its purpose, as well as the three survey links. Survey recruitment was conducted entirely by email, with no other outreach strategies utilised.

The survey invitation was distributed via email to the cohorts identified in the AFEM and academic listservs.

The survey begins with information regarding the study and a request for consent, followed a question assessing a participant's current activity as a physician in facility-based African emergency care. If a participant chose not to consent or denoted that they had not been a physician active in clinical duties in an African emergency care setting for at least three months of the past year, they were directed to the conclusion page of the survey and asked for no further information. Participants that consented and denoted active status as a clinician were brought to the core survey, where five sections of questions assessed their demographics, and usage of and attitudes towards social media.

Survey response rates were monitored by the study team and weekly reminders were sent to non-respondents over an eight-week response period in July and August 2021.

Reminder emails were automated by SurveyMonkey, and the study team was not able to view which participants had and had not responded to the survey.

### **3.4.7 Data analysis**

Results from the three language versions of the survey were merged in Microsoft Excel (© Microsoft Corporation, Redmond, WA, USA). A descriptive analysis was conducted to describe demographic features and prevalence of social media usage. Categorical data were described as proportions for each question. Fisher's exact tests were used to determine if there were significant associations between specialty training and attitudes towards social media use in clinical emergency care. This test was selected due to the fact that most sample sizes for this analysis were small.<sup>215</sup> A p-value of 0.05 was accepted as an indication of statistical significance between groups.

Analyses were conducted using Microsoft Excel (© Microsoft, Washington, USA) and R statistical software (© The R Foundation, Vienna, Austria).

### **3.4.8 Ethical considerations**

Ethical approval for this study was granted by the University of Cape Town Human Research Ethics Committee (HREC REF: 695/2020) (Appendices 3.2 and 3.3).

Participation in the survey was entirely voluntary. No identifying information (e.g., names and contact information) was required in this survey and all responses were anonymous. An optional question at the end of the survey asked for participants to provide an email address, should they wish to be contacted for future interviews related to social media. To ensure that no participants could be linked to their responses, contact information from

section eight was downloaded and stored separately. An anonymous sample does not completely negate the risk of retrospectively identifying a participant or facility by association; however, there was no specific interest in individual delegates and all data were aggregated.

It is important to note that this study was purely observational. No part of the study used, or encouraged the use of, social media in clinical or other professional settings. All parts of this research provide simple descriptions of current practices surrounding the use of social media, and it is likely that this practice was already fairly pervasive in the African clinical emergency care setting prior to survey dissemination.

#### **3.4.9 Data safety**

Data were imported from the backend of SurveyMonkey into password-protected Microsoft Excel files for analysis. Contact information was stored separately from participant responses. The file was stored on an access-controlled desktop computer and available only to the study team. Transfer of data between study team members occurred through encrypted, institutional email. No hard copies of data were generated at any point of the study.

### **3.5 Results**

#### **3.5.1 Respondent demographics**

A total of 70 participants responded to the survey during the eight-week data collection period in July and August 2021. The survey was sent to 893 email addresses on the AFEM and academic mailing lists: An estimated 350 were in LICs, while 340 were in lower-middle-income countries and 203 were in middle-income countries. The overall

response rate was 7.8%; it was much higher in lower-middle-income (14.7%) participants and lower in LICs (5.1%) and middle-income countries (1.0%).

Nearly all (n=67, 95.7%) participants responded to the English version of the survey. Just three respondents (4.3%) used the French version of the survey, and no responses were recorded in the Arabic version. Participants had a median age of 34 years (IQR: 7.0 years). Information on respondent sex was not collected.

Participants were physicians actively providing emergency care in 18 African nations (Table 3.1). The majority of respondents came from countries that were classified as low-income (n = 18, 25.7%) or lower-middle-income (n=50, 71.4%) by the World Bank.<sup>224</sup> Only two respondents (2.9%) practised in upper-middle-income countries, and no respondents were from HICs. Nearly all (n=67, 95.7%) were natives of the African continent, with only three (4.3%) identifying as having relocated from other regions of the world.

**Table 3.1:** Geographic distribution of survey respondents

Country	World Bank income level classification <sup>182</sup>	Total respondents	
		n	%
Tanzania	Lower-middle	23	40.4
Ghana	Lower-middle	9	15.8
Nigeria	Lower-middle	7	12.3
Zambia	Lower-middle	6	10.5
Rwanda	Low	6	10.5
Uganda	Low	4	7.0
Ethiopia	Low	2	3.5
Kenya	Lower-middle	2	3.5
South Africa	Upper-middle	2	3.5
Afghanistan	Low	1	1.8

Cameroon	Lower-middle	1	1.8
Egypt	Lower-middle	1	1.8
Guinea	Low	1	1.8
Lesotho	Lower-middle	1	1.8
Pakistan	Low	1	1.8
Sierra Leone	Low	1	1.8
South Sudan	Low	1	1.8
Sudan	Low	1	1.8
Total		70	100.0

### 3.5.2 Respondent education

All participants were physicians holding medical degrees, though participants had varying levels of training and experience. Participants had a median six years (IQR: 4.0 years) of experience in emergency care since qualifying for their primary medical degree (e.g., MBChB or MD). For the majority of participants, their most advanced education was a primary medical degree (n = 32, 48.6%) or a master's degree related to a medical field (n = 19, 27.1%) (Table 3.2). Nearly one-fifth (n = 17, 24.3%) had completed a non-degree program for specialist training.

**Table 3.2:** Highest level of education completed by survey respondents

Highest education level completed	Total respondents	
	n	%
Primary medical degree (e.g., MBChB or MD)	32	45.7
Master's degree related to medicine	19	27.1
Non-degree specialist training/residency	17	24.3
Diploma in Emergency Medicine	1	1.4
Doctorate degree (e.g., PhD)	1	1.4
Total	70	100.0



Most participants were either currently in specialist training (n = 22, 38.6%) or specialists in emergency medicine (n = 17, 29.8%) (Table 3.3).

**Table 3.3:** Current rank/position held by survey respondents

Current rank/position held	Total respondents	
	n	%
Resident/registrar/specialist trainee	22	38.6
Specialist	17	29.8
Consultant	10	17.5
Non-training junior doctor (i.e., junior doctor not in a registrar position)	6	10.5
Intern	2	3.5

### 3.5.3 Prevalence and use of social media platforms

Participants had a mean of 4.1 (SD = 1.2) social media applications installed on their smartphones, with WhatsApp (n=54, 94.7%) and Instagram (n=50, 73.5%) being most universal (Table 4.4). In addition to the applications noted specifically on the survey (WhatsApp, Telegram, Facebook, Twitter, and Instagram), some participants (n=15, 26.3%) noted that they had additional social media applications installed on their smartphones. A total of nine other applications were mentioned in free-text: LinkedIn, Microsoft Teams, Pinterest, Reddit, Skype, Snapchat, TikTok, YouTube, and Zoom.

WhatsApp was the most commonly used application for both personal (n=43, 75.4%) and work-related (n=34, 59.6%) communications, followed by Instagram for personal (n=10, 17.5%) and work-related use (n=16, 28.6%). Despite being a commonly-installed

application – 70.2% (n=40) of respondents had it installed at the time of taking the survey  
– Facebook was rarely the most common application for personal (n=3, 5.3%) and work (n=1, 1.8%) purposes.

Telegram and Twitter were relatively uncommon primary social media applications, with only two respondents (3.5%) noting each as their primary application for personal and work use.

**Table 3.4:** Current social media usage of survey respondents

Statement	Total respondents (n)	WhatsApp	Telegram	Twitter	Facebook	Instagram	Other
Which of the following social media applications are currently installed on your smart phone?	68	54 (94.7)	38 (66.7)	35 (61.4)	40 (70.2)	50 (73.5)	15 (26.3)
What is the most commonly used social media application installed on your smart phone in terms of frequency of use for <b><u>personal/social</u></b> purposes?	60	43 (75.4)	2 (3)	2 (3.5)	3 (5.3)	10 (17.5)	0 (0.0)
What is the most commonly used social media application installed on your smart phone in terms of frequency of use for <b><u>work-related purposes</u></b> (clinical care, soliciting advice, etc.)?	56	34 (59.6)	2 (3.5)	2 (3.5)	1 (1.8)	18 (31.6)	0 (0.0)

All participants had used social media to communicate to and from other clinicians at least once. The majority of participants stated that they used social media to request advice from other clinicians either daily (n=26, 45.6%) or weekly (n=21, 36.8%) (Table 4.5). Real-time advice provided to other clinicians was also occurring frequently in this group, with most clinicians providing advice to others either daily (n=32, 56.1%) or weekly (n=15, 26.3%). Nearly a third of respondents used social media to request clinical advice five or more times daily, and one-third used it to provide advice at least five times each day.

The providers surveyed in this study also routinely leveraged social media to look up clinical information: Nearly all used it daily (n=29, 50.9%) or weekly (n=19, 33.3%). Only a small proportion used it less than weekly (n=8, 14.1%) and only one respondent (1.8%) reported never using social media to look up information.

**Table 3.5:** Social media use for clinical information sharing by survey respondents

Statement	Total respon- dents (n)	Daily, frequent use (≥5 times per day)	Daily, infrequen t use (≤4 times per day)	Weekly (≥4 days per week)	Weekly (≤3 days per week)	Monthly	Rarely (less than monthly)	Very rarely (less than yearly)	Never
How often do you use social media platforms to request real-time advice <b>from</b> other clinicians?	57	17 (29.8)	9 (15.8)	14 (24.6)	7 (12.3)	2 (3.5)	6 (10.5)	2 (3.5)	0 (0.0)
How often do you use social media platforms to provide real-time advice <b>to</b> other clinicians?	57	19 (33.3)	13 (22.8)	5 (8.8)	10 (17.5)	2 (3.5)	6 (10.5)	2 (3.5)	0 (0.0)
How often do you use social media platforms to look up information related to a clinical situation or presentation?	57	14 (24.6)	15 (26.3)	12 (21.1)	7 (12.3)	1 (1.8)	4 (7.0)	3 (5.3)	1 (1.8)

### **3.5.4 Attitudes towards social media**

Respondents had broadly positive attitudes towards the use of social media in clinical encounters (Table 3.6).

Nearly all participants agreed or strongly agreed that social media is useful (n=33, 82.5%) and informative (n=22, 84.6%) during clinical encounters. Very few clinicians disagreed with this view: Only four participants (10.0%) strongly disagreed that social media platforms are useful in clinical situations, and one participant (3.8%) disagreed that social media can facilitate the use of appropriate clinical information. There were no significant differences in how specialist (i.e., specialist and consultant emergency care physicians) and non-specialist (i.e., non-training junior doctors, interns, and resident/registrar/specialist trainees) emergency care providers perceived the utility of social media (p=0.34) and its ability to aid providers with appropriate clinical information (p=1.00).

Participants also noted that social media can improve the quality of information used in clinical care, with 70% of respondents (n=28) noting that it can facilitate the use of quality clinical information. One-quarter of respondents (n=10) were neutral in regard to social media improving the quality of information used in clinical encounters, and only two (5.0%) disagreed that it improved quality. Specialists and non-specialists had equal levels of agreement about social media boosting the quality of information leveraged by clinicians (p=0.67).

A majority of providers were in agreement that social media use in clinical situations does pose risk to both the clinician (n=20, 64.5%) and the patient (n=22, 53.7%).

A minority of practitioners disagreed that social media use in clinical settings poses risk to the patient (n=10, 24.4%) or provider (n=5, 16.1%). There were no differences in how specialist and non-specialist providers perceived these risks (p=1.00 for provider risks and p=0.52 for patient risks).

**Table 3.6:** Survey respondents' attitudes towards clinical use of social media.

Statement	Total respond- ents (n)	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Differences in attitudes across specialists and non- specialists (p-value)*
Social media platforms are useful during clinical situations.	40	21 (52.5)	12 (30.0)	3 (7.5)	0 (0.0)	4 (10.0)	0.34
Social media platforms can facilitate appropriate clinical information during clinical encounters.	26	10 (38.5)	12 (46.2)	3 (11.5)	0 (0.0)	1 (3.8)	1.00
Social media platforms can facilitate quality clinical information during clinical encounters.	40	7 (17.5)	21 (52.5)	10 (25.0)	0 (0.0)	2 (5.0)	0.67
Social media platforms use in clinical situations carries <b><u>risk to the clinician</u></b> , such as medico-legal risk in case of unintended information loss or incorrect management resulting in harm.	31	5 (16.1)	15 (48.4)	6 (19.4)	1 (3.2)	4 (12.9)	1.00



Statement	Total respon- dents (n)	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Differences in attitudes across specialists and non- specialists (p-value)*
Social media platforms use in clinical situations carries <b><u>risk to the patient</u></b> , such as unintended information loss or incorrect management resulting in harm.	41	10 (24.4)	12 (29.3)	9 (22.0)	9 (22.0)	1 (2.4)	0.52

\*Fisher's exact test comparison of specialist (specialist and consultant emergency care physicians) and non-specialist (non-training junior doctor, intern, and resident/registrar/specialist trainees). Neutral opinions ("neither agree nor disagree") were excluded from these comparisons.

The overwhelming majority of participants (n=32, 88.9%) felt that there was a strong physician community presence on social media applications. Only three respondents (8.3%) disagreed about this strong community presence online, and attitudes were similar across specialists and non-specialists (p=0.19).

Most respondents were in agreement (n=15, 53.6%) or neutral (n=11, 39.3%) on social media allowing for safer clinical care, with only two respondents (7.2%) disagreeing with this statement. Physicians also agreed that social media use allowed for increased quality of care by way of improved communications and accessibility of information (n=20, 71.4%). There were no differences in attitudes towards social media's impacts on safety and quality across specialists and non-specialists, with p-values of 0.57 and 0.30, respectively.

Most also felt that social media could improve the efficiency and speed of emergency care provisions (n=18, 69.2%), though 11.5% (n=3) felt that efficiency was not improved when social media was used. This agreement was similar across specialist emergency physicians and non-specialists (p=0.08). Less than half of respondents (n=13, 46.5%) noted that social media could reduce the cost of emergency care, and one-quarter (n=7) were neutral about its impacts on cost. Attitudes towards cost were similar regardless of the level of training a physician had received (p=1.00).

Half of respondents were in agreement (n=15) that social media improved job performance, and more than half (n=21, 70%) responded in agreement that using social media enables them to care for patients more effectively, increasing productivity of

consultations and reducing time. Ten percent (n=3) felt that social media did not improve their effectiveness, and 26.7% (n=8) did not feel that it improved job performance.

Most participants were interested in expanding their use of social media in clinical practice: 24 participants (82.8%) were seeking new ways to use social media technologies and applications, and five (17.2%) were neutral about exploring new social media uses. No participants noted a lack of interest in further exploring social media as it related to their clinical duties.

Participants showed high interest in seeking new ways of integrating social media into their clinical practice, with 24 respondents noting that they sought to explore new methods of using social media (82.8%). There was a statistically significant association between being a non-specialist and actively seeking new ways to use social media platforms in clinical practice, by exploring new technologies and including more applications on smart phones ( $p = 0.02$ ).

A sizable minority of respondents (n=11, 30.5%) noted concern that social media use in clinical settings may be too time-consuming, but most participants disagreed with this sentiment (n=19, 52.8%).

**Table 3.7:** Survey respondents' attitudes on the impacts of social media on clinical care

Statement	Total respondents (n)	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Differences in agreement across specialists and non-specialists (p-value)*
There is a strong physician community that I can access through social media platforms.	36	14 (38.9)	18 (50.0)	1 (2.8)	1 (2.8)	2 (5.6)	0.19
Social media platforms' use in clinical situations allow for safer clinical care.	28	3 (10.7)	12 (42.9)	11 (39.3)	1 (3.6)	1 (3.6)	0.57
Social media platforms' use in clinical situations allow for improved quality of care (performance, communication, accessibility, etc.).	28	6 (21.4)	14 (50.0)	6 (21.4)	2 (7.1)	0 (0.0)	0.30

<b>Statement</b>	<b>Total respondents (n)</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neither agree nor disagree</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Differences in agreement across specialists and non- specialists (p-value)*</b>
Social media platforms' use in clinical situations allow for improved efficiency (getting required information faster, speeding up care, matching the right care at the right time for the right clinical effect).	26	3 (11.5)	15 (57.7)	5 (19.2)	3 (11.5)	0 (0.0)	0.08
Social media platforms' use in clinical situations reduce the cost of care.	28	5 (17.9)	8 (28.6)	7 (25.0)	5 (17.9)	3 (10.7)	1.00
Using social media platforms improves my job performance.	30	6 (20.0)	9 (30.0)	7 (23.3)	6 (20.0)	2 (6.7)	0.37

Statement	Total respondents (n)	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Differences in agreement across specialists and non- specialists (p-value)*
Using social media platforms enables me to care for patients more effectively (achieving more productive consultations within a shorter time).	30	6 (20.0)	15 (50.0)	6 (20.0)	3 (10.0)	0 (0.0)	0.19
I actively seek new ways to use social media platforms in my clinical practice, by exploring new technologies and including more applications on my smart phone.	29	8 (27.6)	16 (55.2)	5 (17.2)	0 (0.0)	0 (0.0)	0.02

Statement	Total respondents (n)	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Differences in agreement across specialists and non- specialists (p-value)*
I am concerned that using social media platforms in my clinical practice will consume too much time and that this will affect my clinical productivity.	26	3 (8.3)	8 (22.2)	6 (16.7)	11 (30.6)	8 (22.2)	0.48

\*Fisher's exact test comparison of specialist (specialist and consultant emergency care physicians) and non-specialist (non-training junior doctor, intern, and resident/registrar/specialist trainees). Neutral opinions ("neither agree nor disagree") were excluded from these comparisons.

Substantial attrition occurred during this survey: While 70 participants completed the demographics section of the survey and at least some questions related to current social media usage, only 57 (81.4%) continued on to questions regarding frequency of use. Forty-one (58.6%) continued on to questions surrounding attitudes towards social media use in emergency care, and just 36 (51.4%) completed the survey in full.

### **3.6 Discussion**

In this chapter, the successful implementation of a cross-sectional survey of facility-based emergency care practitioners in Africa is documented. The study describes this group's social media use, highlighting the perceived value of social media in their clinical practice and key areas for further research. This chapter provides what is, to our knowledge, the first-ever study of the use of social media in both African emergency care and more broadly in LRS.

#### **3.6.1 Survey responses**

Despite distribution of the survey across multiple listservs and the use of follow-up reminder emails, the response rate remained far lower than previous research studies had suggested. This study was distributed nearly a year into the COVID-19 pandemic when healthcare providers worldwide were overworked and experiencing unprecedented burnout.<sup>225</sup> It is likely that this contributed to a lower rate of engagement with the survey. There was also significant attrition within the survey, with only just over half of participants completing the survey in full. These missing responses suggest that the survey was likely too long; perhaps questions were also too complex. Again, this attrition may have been caused by constant professional and personal demands on African healthcare providers during the pandemic.<sup>226</sup>



Although the survey was made available in three languages (English, French, and Arabic), no respondents used the Arabic version and only three responded to the French version. All education is delivered in English in the majority of African medical schools, including those in Arabic speaking nations. This level of engagement with English has likely led to fluency for most African physicians, allowing them to easily respond to the English version of the survey.

### **3.6.2 Respondent demographics**

Nearly all respondents were African natives practicing in low- or lower-middle income countries. More than one-third were native Tanzanians, but respondents hailed from all five regions of Africa. The number of email requests sent to LICs and lower-middle-income countries were nearly equal; however, the response rate was substantially higher in lower-middle-income countries. Providers in these countries may have somewhat higher incomes, and their clinical settings may be slightly better-resourced. This could lead to their being more connected and having a stronger online presence, thus generating a higher level of response. Response in MICs was quite low. It should be noted that the only MIC included in this request for survey participation was South Africa. At the time, South Africa was extremely burdened by COVID-19 and clinical staffing shortages that were worse than other parts of the continent.<sup>227</sup> This could have led to less engagement with an online survey. Furthermore, emergency care is very well established in South Africa; it was there that the first residency program was established to train emergency physicians in Africa.<sup>159</sup> Participants may be more interested in novel research, and an emergency care study likely seems less novel in South Africa compared to other parts of the continent.

Participants were very young, primarily in their 30's, and relatively early in their careers. This was expected because African emergency care is in its infancy: Only a small handful of countries have recognised emergency medicine as a specialty area and most speciality training programs for physicians are less than a decade old.<sup>159</sup> The age of emergency care providers will naturally be lower, because training opportunities have only existed for a brief period of time and typically those opportunities are undertaken shortly after medical school. Social media use tends to be higher in younger generations, who have grown up with technology and are considered "digital natives."<sup>228</sup> In the context of this, it is not surprising that respondents were overwhelmingly comfortable with using social media for professional purposes.<sup>229</sup> It is likely that this group's technological fluency will serve as a facilitator for further expansion of the uses of social media in clinical emergency care.

### **3.6.3 Respondent education**

Although respondents were relatively early in their careers, averaging well under a decade of experience, many had already pursued additional training or education related to their clinical work. One in four held a master's degree in a medical field, and one in five respondents had completed a specialist training or residency programme. Many were in emergency medicine specialist training programs. These results suggest that those working as physicians in facility-based emergency care settings are a highly trained group with strong interest in continuing their educations.

### **3.6.4 Prevalence and use of social media platforms**

The most common social media platforms for both personal and professional use were WhatsApp and Instagram. It was expected that these would be the social media applications of choice for at least some respondents, as they are some of the largest

platforms globally and in Africa: In 2022, WhatsApp was the third most common social media platform, with two billion monthly active users, and Instagram was the fourth, with 1.5 billion monthly active users.<sup>16 17</sup>

The most common social media platform worldwide, as well as in Africa, is Facebook, which has nearly three billion users each month.<sup>16 17</sup> While a large portion of participants had Facebook installed on their phones, they did not note it as their primary application of choice. YouTube is also more commonly used worldwide than WhatsApp and Instagram, with 2.5 billion active users each month.<sup>16</sup> Despite this, few participants had YouTube installed on their smartphones, and none noted it as their most commonly used social media platform.

Most respondents noted that the same application of choice for both personal and professional purposes. Healthcare practitioners, particularly those in a fast-paced environment like EUs, may prefer to use the same social media applications for work and personal due to ease of use and familiarity. It suggests that healthcare workers do not mind having their online presences for their professional and personal lives in the same space. This preference towards already-available applications may limit interest in development of purposefully designed healthcare social media platforms or existing professional sites such as LinkedIn.

Although some participants identified that they had additional social media applications installed on their smartphones, applications in the “other” category were not noted as the most commonly used applications for either personal or professional purposes. This confirms that the correct applications were offered as specific choices, although there

may be some bias due to ease of selecting an existing option version filling in free-text when selecting “other.”

Responses confirm that African emergency care providers understand how to use social media to obtain and share information, although this study did not investigate to what degree they felt their use was effective. Notably, all participants had used social media to communicate advice both to and from other clinicians at least once, signifying the ubiquity of social media in African emergency care. Many respondents noted that they use these platforms numerous times during each shift to request advice from, or provide advice to, other clinicians. The providers surveyed in this study also routinely leveraged social media to look up clinical information, although it remains unknown what, specifically, providers are searching for on social media.

These results align with studies conducted in HICs, which found that physicians frequently leverage social media for the purposes of exchanging advice and increasing their clinical knowledge.<sup>230-232</sup> However, in HICs, Twitter, Facebook, and LinkedIn appear to be the preferred platforms for these purposes, while the LIC providers sampled in this study preferred WhatsApp and Instagram.<sup>230</sup>

### **3.6.5 Attitudes towards social media**

While a substantial body of evidence already existed to document the physicians’ support for social media use in their clinical work, previous literature studied HICs almost exclusively.<sup>233</sup> This study established that attitudes towards the use of social media in facility-based emergency care in African LMICs is overwhelmingly positive.<sup>234</sup> Respondents highlighted that social media is a highly-utilised tool that can be easily

leveraged in real-time to obtain appropriate and effective clinical information in the emergency care setting. They also felt that it can improve safety and factors associated with cost, such as speed. Social media use leads to what respondents feel are high-quality clinical encounters, and presumably has positive impacts on patient outcomes and satisfaction. Providers also agreed that the information available on social media platforms can aid in matching patients to the correct level of care, which is especially important when resources are limited. These supportive sentiments were shared by nearly all respondents, regardless of the amount of additional training they had received beyond medical school. This suggests that all providers, even those with substantial education and experience, benefit from the clinical information available on social media.

At present, extremely limited data exists to quantify the effects of social media on patient interactions and outcomes. Most available data focusses specifically on the impacts to patients and no studies have been conducted specifically in LRS.<sup>229</sup> The strong beliefs expressed in this survey that social media can improve cost and time factors related to emergency care are of specific importance in African LRS, where it is established that resource constraints negatively impact patient outcomes.<sup>235 236</sup>

The Likert scale questions allowed for a nuanced understanding of attitudes surrounding social media use in facility-based emergency care. Importantly, disagreement was found relating to the risks of use. A minority but not insignificant number of providers saw no risk to either patient or provider. Despite different lengths of education, specialist and non-specialist physicians had no significant differences in their interpretations of the risks of social media use. This may mean that additional training does not yield a better understanding of the ethical and practical dangers of social media use in clinical settings.

The risks are already well-established,<sup>67 71 72 75</sup> and it is clear that most African emergency care practitioners will be using social media in their clinical work. Therefore, these risks must be better defined, both in training and on the job. Education should focus on both those already practicing emergency care and those in the training pipeline. Medical schools and emergency medicine specialty training programmes may benefit from the inclusion of some training on how to appropriately and safely implement social media in clinical practice. No references could be found to social media use in medical school curricula, but it could perhaps be integrated into the ethical training that is nearly universal in medical education.<sup>237</sup>

### **3.7 Limitations**

There are some limitations inherent to this study's methodology. First is in its sampling: The use of specified contact databases may have, due to respondents' geographic clustering, introduce a selection bias in the survey and reduce internal validity – there may be systematic differences between those that did and did not participate. The results may misrepresent the true picture since geographic location of individuals is not evenly distributed across the continent. The survey only reached those participants affiliated with AFEM and/or an academic institution, and thus results do not reflect those practicing outside of these groups. However, AFEM's network is expansive, with many of its members working in non-academic healthcare facilities; this reach allowed for increased heterogeneity in respondents' work settings.

Emergency care is unique in that, while it is ideally provided in the controlled and resourced setting of an EU, it can be provided in other parts of healthcare facilities. Many practitioners provide emergency care in other parts of hospital because there is no EU,

and therefore may have self-excluded or not been identified for recruitment because they do not consider themselves emergency care providers.

Surveys are also at risk of misinterpretation, with participants not interpreting specific questions as the creator intended and responding based on inaccurate understandings. This survey was extensively pilot tested in an effort to improve readability and consistency of interpretations across the three languages in which it was provided. Data collected from surveys may also lack the depth and detail on the specific research topic, however, this study is meant to provide a snapshot of the availability of resources across different countries (i.e., laying a foundation on which a framework and future studies can be built).

Although the survey was sent to a broad group on multiple email listservs, the response rate for this study was perhaps low, at approximately eight percent. A response rate of this level is not uncommon for large, online surveys, and the target population (i.e., emergency care providers) being committed to the COVID-19 response further contextualises this rate. This low response rate, in combination with attrition during the survey, limited the sample size of respondents for some questions, particularly towards the end of the survey. This limited analytical statistics that could be generated to describe respondents' social media use, but all study objectives were still met.

Language barriers may have also caused bias. As all AFEM activities are conducted and communicated in English, it is likely that a large proportion of the participants identified for this study using AFEM email listservs understand a sufficient amount of English to be able to complete the survey. It is also suspected and hoped that those most vocal about social media will be confident English speakers, as English is the medium used for

publicising and disseminating opinions and outputs across practice settings on much of the continent. A bias may have been introduced, however, by exclusion of participants who may have provided good insight but have a poor grasp of spoken or written English. The survey was made available in Arabic and French to mitigate this bias, but there is a chance participants may have used the English option because it is the norm in medical settings, despite being less comfortable with it.

### **3.8 Conclusions and next steps**

The findings of this study provide insight into social media use of African emergency care physicians, suggesting that social media use in this group may be ubiquitous. It is clear that most clinicians surveyed use social media multiple times each day and that the purposes vary: In some instances, it may be used to communicate advice, and in others, to receive it. Many felt that social media is positively impacting both the patient and provider experiences, and that it is simultaneously improving speed and safety – two factors that are usually in competition in healthcare.<sup>238</sup> It is perhaps unsurprising that social media has taken off with such vigour in African emergency care, a setting wherein specialty training remains limited and a group of relatively young practitioners is geographically spread across a large region.<sup>239 240</sup> Organisations seeking to further improve emergency care provisions on the continent should consider social media as a key method to reach these providers, and should focus their efforts particularly on WhatsApp and Instagram platforms.

Prior to this study, very little data existed previously to describe social media use in LRS healthcare settings, particularly for the field of emergency care. The results of this study elucidated a number of potential areas for further research. In this dissertation's third



study, a several questions generated from this survey will be further explored in individual interviews. These interviews will explore perceptions of the risks and benefits, and barriers and facilitators, of social media as a point-of-care tool for emergency care. Benefits to its use will be of particular interest, given that a majority of providers felt that social media use could not reduce healthcare costs, despite it increasing core factors of cost such as efficiency. Interviews will also study exactly how African emergency care practitioners' preferred platforms – WhatsApp and Instagram – can be leveraged to further improve their clinical care and understand what content they are seeking.

In order to understand the impacts of social media on the entire emergency care system, additional studies will be necessary. Increased representation of various levels of emergency care providers beyond physicians will be important, as will studying facility-based provisions of care. Furthermore, strategies should be implemented to better engage with the target population to improve response rates and reduce attrition from the start of the survey. The high prevalence of use of social media by this group in this setting, and their overwhelmingly positive attitudes surrounding it, warrants further research focusing on other types of healthcare providers (e.g., nurses and paramedics) and other settings where emergency care is delivered (e.g., prehospital in ambulances). The patient perspective, including risks to this group and their opinions on real-time use of social media by clinicians during their care, should also be investigated. Given the low response rate and attrition seen with this survey, future cross-sectional studies should consider being more concise and should be disseminated to larger populations.

Finally, this study's results – particularly the identification that some practitioners do not feel there are any risks to patients or providers when using social media in clinical care -

suggest that guidance on social media use in this setting must be developed and implemented. Postdoctoral work related to this dissertation will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

## **Chapter 4: Qualitative assessment of the use of social media as a point-of-care tool by facility-based emergency care practitioners in Africa.**

### **4.1 Introduction**

For most adults, social media is omnipresent in day-to-day life, and it is also becoming the same in professional settings, including clinical medicine.<sup>241</sup> The average person spends more than two hours on social media platforms each day.<sup>13</sup> Their participation in social information-sharing takes shape in numerous ways, including sharing of photos and videos, blogging, social gaming, and professional networking.<sup>13</sup> Social media has become an integral component of modern day life, enabling everything from staying in touch with loved ones to learning new information.

Numerous studies have documented the specific uses of social media in the medical field. Healthcare providers are using social media to learn more about their specialty, including specific procedures and skills.<sup>242</sup> Social media is playing a role in communications between patients and providers and is a critical tool for modern research recruitment.<sup>243</sup> <sup>244</sup> Providers are also using social media to connect with providers on a more personal level, gaining a support network.<sup>244</sup> Despite frequent use in the workplace, studies have shown that healthcare providers have critical gaps in knowledge on how to safely use social media for clinical and professional purposes.<sup>242 245 246</sup> This is due in large part to a lack of education surrounding the topic. For example, a 2018 survey conducted in Singapore identified that 84% of physicians had not received any education on social media usage during their medical schooling, and 14.3% were not even aware of whether their facility had formal guidelines on social media use.<sup>245</sup> Furthermore, many participants

in the study did not know how to appropriately set their privacy settings to provide a layer of protection for patient information.

## **4.2 Motivation**

Prior to this dissertation, no studies has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa. In Chapter 2, a scoping review was conducted that identified strong but nascent evidence for the use of social media in facility emergency care. Available evidence, which assessed only the WhatsApp platform, provided support for both the diagnostic power of imaging when transmitted via WhatsApp and the impact of the platform on EU consultations and patient care metrics. In Chapter 3, the findings of Chapter 2's scoping review were used to inform a continental survey on the use of social media for point-of-care purposes by physicians practicing emergency care in Africa. The findings of the survey provided insight into social media use of African emergency care physicians, suggesting that social media use in this group is ubiquitous. Most clinicians that responded to the survey noted use of social media multiple times each day to improve clinical care via real-time advice giving and receiving. The overwhelming sentiments of those surveyed were that social media improves their provision of emergency care by improving speed and safety, thus positively impacting patient outcomes. Survey results suggested that providers are aware of the risks of using social media for emergency care and interested in guidelines to direct their use of these platforms.

The scoping review provided broad context to social media use in emergency care. The survey then generated a novel overview of how social media is being used in African emergency care; however, the nature of the questionnaire limited the depth of information

that could be gathered from respondents. Prior to development of a framework on social media use in emergency care settings that provides critical risk management, further investigation needs be conducted on how and why clinicians are using it in LRS.

### **4.3 Aim and objectives**

Study three aimed to describe facility-based African emergency care practitioners' perception of, and intention to use, social media as a point-of-care telemedicine tool. It was the second phase of a two-phase sequential quantitative-qualitative mixed methods approach taken to obtain a comprehensive description of the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa.<sup>247</sup>

This study had the following objectives:

4. Describe intentions to use social media as a point-of-care telemedicine tool in facility-based African emergency care,
5. Describe perceived risks and benefits to using social media as a point-of-care telemedicine tool in facility-based African emergency care, and
6. Describe perceived facilitators and barriers to using social media as a point-of-care telemedicine tool in facility-based African emergency care.

### **4.4 Methods**

As noted above, this study is part of a pre-planned, sequential two-study effort to describe social media use in African emergency care. The first study, described in Chapter 3, explored social media use in this setting via a quantitative survey. To gain a more in-depth understanding, this survey was followed up by in-depth qualitative interviews with voluntary participants.

#### **4.4.1 Study design**

This is an exploratory qualitative study involving thematic analysis of in-depth, semi-structured interviews to gain an understanding of African clinicians' views, attitudes and behaviours towards social media use to enhance bedside emergency care. Broadly, taking a qualitative approach to interviewing allows interviewees to “respond in their own words”, and “to express their own personal perspectives.”<sup>248</sup> Moreover, this form of systematic interviewing minimises interviewer effects. According to Seale et al., the less structured the interview, the more the participants will be able to identify and concentrate on the most significant aspects of their experiences.<sup>248</sup>

In semi-structured interviews, an interview guide is used to facilitate dialogue between the interviewer and interviewee.<sup>249</sup> The approach is known as “semi-structured” because the facilitation guide is considered flexible: Questions can be modified or eliminated based on responses to earlier questions, which allows for deeper explorations of a unique participant's views.<sup>250</sup> The interview facilitator may use pre-scripted probes to further question an interviewee's train of thought, or they may add follow-up questions on the spot. Researchers consider semi-structured interviews to be a “happy medium” between completely unstructured conversations – which are difficult to replicate across interviews and analyse – and structured interviews – which lose the spontaneity and nuance of candid conversations.<sup>251</sup>

In order to conduct semi-structured interviews – and to avoid the need for unstructured interviews with few guiding questions - there must be enough evidence to guide the generation of meaningful questions surrounding a research topic.<sup>251</sup> The evidence surrounding social media use in emergency care is limited, but the previously-conducted

survey collected important high-level data to inform this qualitative phase. These interviews served to broadly explore social media emergency care practitioners use, and why, how, and when they use it. Perceived benefits and risks associated with social media use were also sought. Therefore, the plasticity of a semi-structured approach was ideal to capture the potentially unexpected and nuanced views that interviewees may present.

#### **4.4.2 Study sampling**

Recruitment into this study was non-probability and purposive,<sup>252</sup> done by convenience sampling of survey respondents expressing willingness to participate in a follow-up interview. A secondary snowball sampling method was also established, in case additional participants were required to reach saturation: If or when survey contacts were exhausted without oversampling any one region or income setting, then follow-up recruitment would be done through requesting contacts from participants that had already been interviewed.<sup>253</sup> This technique is particularly effective in studies of early adopters since there are usually few individuals involved: They are usually the best resource for determining who else is involved in the field.<sup>253</sup> Although this study aimed to interview participants from across the large African continent, it was anecdotally known prior to this study that the African emergency care community was extremely close knit and that the networks for recruitment were well established.

Geography and sociodemographic characteristics vary drastically across the African continent, but most countries fall into the lower-middle- and low-income categories. Given that these countries are least represented in the literature but most likely representative of the African continent, participants from LICs and lower-middle-income countries were prioritised for recruitment.<sup>182</sup>

There was no pre-set sample size requirement for this study, only an aim to reach qualitative saturation. Based on existing studies with research questions of similar size, it was anticipated that this would be reached with seven to 10 interviews.<sup>254</sup> Saturation in qualitative studies is somewhat subjective and determining the point at which it has been reached requires iterative analysis of existing data. Saturation was determined based on thematic repetition: When participants' responses become predictable and there is little new information emerging, with the same themes emerging in subsequent interviews, it indicated that saturation had been achieved.

#### **4.4.3 Study population**

In order to participate, potential interviewees were required to meet the following criteria:

- Aged at least 18 years,
- Worked as a provider in a facility-based African emergency care setting at the time of the interview, and
- Had at least one year of self-reported cumulative experience using social media to share, distribute, or seek – in real-time – answers to clinical emergency care questions in a facility-based African emergency care setting.

Potential participants were identified from the pool of survey respondents that opted in to be contacted regarding a potential follow-up interview. Contact information for those that consented to the secondary communication was exported from SurveyMonkey in a separate file that did not contain any of their previous survey responses. Potential participants were sent a standardised email, informing them of the purpose of the study and eligibility and consent information. Those that responded with interest in participation were screened against the above criteria via email. Participants that met inclusion



requirements were notified as such, and interviews were scheduled at a mutually convenient time.

#### **4.4.4 Facilitation guide development**

Following the conclusion and preliminary analysis of the survey described in Chapter 3, a facilitation guide was developed to further explore social media use in the African emergency care setting. Interviews were intended to be semi-structured, meaning that questions were available to guide the interview but not rigid.<sup>255</sup> Therefore, the guide was developed with the intention of clustering questions into groups, to meet study objectives. The intention was that, as long as at least some of the questions in each grouping were addressed, the objectives would be met.

In line with existing guidance on developing interview facilitation guides,<sup>251 256</sup> the draft guide was piloted with two individuals: One individual had expertise in the qualitative interview process, and the other had expertise in African emergency care. Feedback was collected from both mock interviews and incorporated into the final version of the guide (Appendix 4.1). Having these two perspectives ensured that the questions made logical sense in the clinical setting and were also methodologically sound.

#### **4.4.5 Facilitation guide components**

The facilitation guide contained four sections. In part one, rapport was built between the interviewer and participant. The interviewer described their background, and the participant was asked to describe theirs, including their current clinical role(s) and practice setting(s).

In part two, following a review of the study's definition of social media, personal social media use was explored in line with study objective one (to describe intentions to use social media as a point-of-care telemedicine tool in facility-based African emergency care). Participants were first asked to briefly describe their non-professional use of social media, as this information may be of use when comparing how use differs in personal and professional contexts. Then, participants were asked to specify what social media applications they use in their clinical practice as physicians providing emergency care. They were asked to expand on why and how they use each application mentioned in the clinical setting.

Part three of the interview focused on perceptions that participants held surrounding real-time social media use in facility-based emergency care. They were also questioned on what they think those they practice with (e.g., colleagues and supervisors) believe about social media use in this setting. Participants were then asked to discuss the risks and benefits of use, as well as any guidelines or regulations that governed social media use in their practice. This portion of the study sought to meet objective two, describing perceived risks and benefits to using social media as a point-of-care telemedicine tool in facility-based African emergency care.

Lastly, in part four, barriers and facilitators to social media use in participants' clinical settings were explored to meet the study's third objective (to describe perceived facilitators and barriers to using social media as a point-of-care telemedicine tool in facility-based African emergency care). In this final section, the interview encouraged conversation around what could be done to enhance the use and impacts of social media in the African emergency care setting.

#### **4.4.6 Key definitions**

Key definitions adhered to in this study are described in Section 1.5.5, Key definitions. To maintain consistency in responses, the study's definition of social media was provided to all participants at the start of each interview and reiterated as needed throughout conversations.

#### **4.4.7 Interview data collection**

Interviews were selected as the primary method of data collection because this approach encourages open information exchange and targeted follow-up questions.<sup>248</sup> One-on-one interviews between participants identified from the survey and a researcher (the PhD candidate) were recorded and transcribed for analysis. Video interviews were targeted; however, low bandwidth and internet connectivity challenges led to a switch to audio-only interviews.

Given the aim of this study to capture information about social media use in emergency care throughout the continent, a range of platform options were offered for interviews. The primary platform offered was Microsoft Teams but Zoom and encrypted WhatsApp calls were also agreed to by the interviewer as needed, in instances where a participant knew that a specific platform would function best. Interviews were primarily conducted in English; however, when needed; a translator was offered. Interviews were expected to last approximately 30 to 45 minutes.

Prior to beginning, the interviewer reviewed the study and obtain written informed consent from those who choose to participate via electronic signature (Appendix 4.2). The interviewer then electronically signed the same version of the consent form.

All interviews were recorded via Dictaphone with handwritten notes generated simultaneously.

A inductive approach was taken in the early stages to derive theories from the interview data as interviews took place.<sup>257</sup> Themes were identified from the notes immediately following interviews and organised into checklist matrices. Checklist matrices condense data into simple categories for coding.<sup>258</sup> This method was not intended to be a form of final analysis, but rather provided a summary of the interviewer's perceptions that were later checked against the fully transcribed transcripts to facilitate subsequent, more intensive analysis. Simultaneous data collection and analysis and the semi-structured nature of these interviews gave each interview the potential to inform and enhance subsequent interviews. A semi-structured approach was selected for several reasons. This approach provides flexibility, with open-ended questions and opportunities for follow-up questions. Furthermore, it takes a participant-centred approach, wherein the participant's perspective is prioritised throughout the discussion. It also allows for an iterative approach, with refinement of questions based on initial interviews; this process is essential in a nascent research area where themes may be unpredictable. Interviews continued until thematic saturation was reached.<sup>258</sup>

#### **4.4.8 Content analysis**

A general content analysis approach was taken, as such an approach is useful in identifying and reporting on new and repeated patterns within qualitative data.<sup>259</sup> Content analyses are particularly effective when researchers are looking to describe thoughts and experiences, which were both of great interest in this study.<sup>260</sup>

Full transcription of each interview occurred prior to analysis, with all potentially identifying information (e.g., names and specific workplaces) redacted. Data were organised and analysed using NVivo11 qualitative analysis software (© QSR International, Burlington, MA, USA). At a high level, nodes were developed to represent broad categories and themes within the text. Analysis of the full transcript data began by dividing the interviews into 'meaning units', or segments of text that each contain one main idea. Units from each interview were labelled with terms similar to those used by the interviewee, and then the labels were used to place these meaning units within appropriate nodes.<sup>248</sup> As datapoints were aggregated into these nodes and cohesive sub-concepts emerged, the larger nodes were split into smaller ones; this allowed for a hierarchical structure where both overarching themes and sub-themes could be visualised. Annotations were added to nodes to capture overall themes and researcher insights.

Data were analysed independently by the interviewer and a second researcher to enhance the validity and reliability of the findings. Due to challenges with scheduling, member checking – where participants are contacted to review analyses and confirm interpretations – was not feasible.

Member checks were conducted via email with individual participants to ensure that data accurately reflected participants' described experiences.<sup>261</sup>

#### **4.4.9 Ethical considerations**

Ethical approval for this study was granted by the University of Cape Town Human Research Ethics Committee (HREC REF: 695/2020) (Appendices 4.3 and 4.4).

Participation in this interview process was entirely voluntary and all participants provided informed consent (Appendix 4.2). No identifying information (e.g., names and contact information) were required and all responses were anonymous. A key risk is that subjects could be identifiable from the content of the interviews later provided in reports. Subjects were asked to answer questions on their use of social media in healthcare settings, whether or not this use is sanctioned by the system in which they practice. Interviewers ensured all participants understood that full anonymity was not guaranteed and therefore that participants are free to not answer any questions they felt uncomfortable with or end the interview at any time. An anonymous sample does not completely negate the risk of retrospectively identifying a participant or facility by association; however, there was no specific interest in individual delegates and all transcribed data were aggregated.

Similar to the survey described in Chapter 3, this study was solely observational. No part of the study used, or encouraged the use of, social media in clinical or other professional settings. All parts of this research provide simple descriptions of current practices surrounding the use of social media, and it is likely that this practice was already fairly pervasive in the African clinical emergency care setting prior to survey dissemination. This research provided the opportunity to describe the extent of social media use to enhance clinical care at a critical junction of the patient journey in EUs. Information gained from this study was anticipated to further the understanding of perceived risks and benefits; matched against existing, described risks and benefits, this new information would allow a more considered response to managing social media use in clinical practice.

#### **4.4.10 Data safety**

Data on potential participants were imported from the backend of SurveyMonkey into password-protected Microsoft Excel files for analysis. Voluntary contact information was stored separately from participants' survey responses, and no survey responses were linked to the interviews conducted in this study.

Interview notes and the recording device were stored in a locked cabinet on site. Following interview transcription and redaction of sensitive information, all recordings were erased as established in the original ethics protocol (Appendix 4.4). Transcription files were stored on an access-controlled desktop computer and available only to the study team. Transfer of data between study team members occurred through encrypted institutional email and no hard copies of data were generated at any point of the study.

### **4.5 Results**

A total of eight interviews were conducted with participants between October and December of 2021. Interviews were conducted until saturation of themes was reached. Interviews took a mean 27.3 minutes to complete (SD=9.2 minutes).

#### **4.5.1 Participant characteristics**

Participants were located in four countries - Ethiopia, Ghana, Kenya, and Zambia - with 75% (n=6) in lower-middle-income countries and 25% (n=2) in LICs (Table 4.1).

**Table 4.1:** Geographic distribution of interview participants

Country	World Bank income level classification <sup>182</sup>	Total respondents	
		n	%
Zambia	Lower-middle	4	50.0
Ethiopia	Low	2	25.0
Ghana	Lower-middle	1	12.5
Kenya	Lower-middle	1	12.5
Total		8	100.0

Nearly all (n=7, 87.5%) participants were speciality-trained Emergency Physicians. Only one provider (12.5%) was not a physician, but rather, the Head Emergency Nurse in their department (Table 4.2). Half of participants described additional that they held, including two that were Heads of their respective EUs, one that was President of their country's emergency care society, and one was an external consultant for emergency care development.

Most (n=5, 62.5%) worked at tertiary academic hospitals that were affiliated with medical universities. The remaining three respondents (37.5%) worked in regional referral hospitals, two of which (25%) were at public facilities and one of which (12.5%) was at a private facility.



**Table 4.2:** Interview participants' workplace roles and settings

Participant no.	Role(s)	Facility type
1	Emergency Physician	Tertiary academic hospital
2	Emergency Physician and President of national emergency care society	Tertiary academic hospital
3	Head Emergency Nurse and emergency care development consultant	Tertiary academic hospital
4	Emergency Physician and Head of EU	Tertiary academic hospital
5	Emergency Physician	Regional referral hospital
6	Emergency Physician and Head of EU	Tertiary academic hospital
7	Emergency Physician and Head of EU	Private referral hospital
8	Emergency Physician	Regional referral hospital

#### 4.5.2 Prevalence and use of social media platforms for personal purposes

Participants highlighted a broad range of social media applications being used for personal purposes (Table 4.3). All participants (n=8, 100.0%) mentioned both WhatsApp and Facebook use in their personal lives. Many also mentioned Twitter (n=4, 50.0%) and Telegram (n=3, 37.5%). The main purposes of all personal social media use were to communicate with friends and family and share photos. Some participants mentioned specific use cases, such as watching television shows, connecting with others that share their hobbies, and finding recipes.

**Table 4.3:** Participants' personal social media use

<b>Social media application</b>	<b>No. respondents mentioning use (n (%))</b>	<b>Purpose(s)</b>
Facebook	8 (100.0)	Watching television series; social groups specific to hobbies; finding recipes to cook
Facebook Messenger	2 (25.0)	Communication with friends and family
Instagram	2 (25.0)	Photo-sharing; following accounts related to personal hobbies
Snapchat	1 (12.5)	Photo-sharing
Telegram	3 (37.5)	Communication with friends and family
TikTok	1 (12.5)	Watching videos related to hobbies
Twitter	4 (50.0)	Socialising; sharing personal opinions and political views
WhatsApp	8 (100.0)	Communication with friends; photo-sharing

#### 4.5.3 Prevalence and use of social media platforms for work-related purposes

The social media applications that participants noted clinical use of differed somewhat from those used in their personal lives (Table 4.4). Despite all participants noting personal use of Facebook, less than half (n=3, 37.5%) stated that they used it for clinical purposes. One participant shared that Facebook groups were useful, and that they participated in a country-wide doctors-only group where cases could be shared for feedback. Another noted that Facebook pages allowed them to stay up-to-date on the happenings of their national and international emergency care societies, and it allowed them to feel connected to providers in other regions.

Contrastingly, all participants (n=8, 100.0%) mentioned WhatsApp use for both personal and work-related means. WhatsApp was extremely valuable to all interviewees. They noted a range of uses, and multiple respondents stated that they used the application more than hourly while on duty. The application was used for real-time consultations when complex patients presented to EUs. For example, one participant noted,

*“We can use it for consultation purposes. So, yesterday night, we had one patient with intracranial and coronary blood haemorrhage with bad brain bleeds, so the resident will post on the WhatsApp group and the team will suggest how to proceed with managing this kind of patient.”*

Those in management roles also mentioned WhatsApp’s utility in planning departmental logistics:

*“I used WhatsApp to share the schedule or rotation. I put that on that unit WhatsApp group and we all can stay on the same page regarding what’s going to happen in the coming weeks.”*

These self-reportedly busy clinicians used WhatsApp as a meant of staying up-to-date on emergency care content:

*“Information related to latest research work and trends in emergency medicine...is shared across all the WhatsApp groups I am in.”*

A smaller number of participants (n=3, 37.5%) used Telegram for similar purposes to WhatsApp. One participant shared that their facility used Telegram for a number of reasons:

*“On Telegram, we have different telegram groups in our day-to-day clinical and academic practices. There's an emergency Telegram group, an ICU critical care Telegram group, an academic staff Telegram group. So, we post common cases and unique or different images to the Telegram group.”*

Instagram and Twitter were used largely for educational purposes and connecting with the broader emergency care community.

Three additional platforms were discussed in the context of professional social media use: Microsoft Teams, Zoom, and LinkedIn. Microsoft Teams and Zoom were noted to be used exclusively for meetings and education. As was noted by one participant, these applications were of particular importance during the COVID-19 pandemic, when emergency care providers were aiming to reduce unnecessary exposures and travel restrictions were in place. One participant stated that, Zoom and Teams *“...were mostly for lectures. The use of this was demonstrated during the COVID period, when students and instructors could not meet in the seminar rooms and all lessons occurred online.”* The same participant also highlighted that online meeting platforms can allow for international guest lectures, which increase learning and knowledge-sharing without the need for travel.

One participant shared that LinkedIn allowed them to identify job opportunities beyond their local area, and a second noted that it was a useful means of staying in touch with those that they meet at emergency care conferences. That participant also noted that they enjoyed connecting with, *“individuals who are passionate about the same kind of work you do.”*

No participants mentioned clinical use of TikTok, Snapchat, or Facebook Messenger, although personal use of these applications was noted.

There was a general sentiment that all social media use in their clinical practice was driven by necessity. One participant shared that:

*“So far, for the low resource setting, we don't have an option. I think we have more benefits to using a social media platform than not to. It is just where we are at the moment given the context of few specialists and limited knowledge.”*

**Table 4.4:** Participants' work-related social media use

<b>Social media application</b>	<b>No. respondents mentioning use (n (%))</b>	<b>Purpose(s)</b>
Facebook	3 (37.5)	Closed groups for providers within facilities or emergency care societies; sharing and receiving case studies
Instagram	2 (25.0)	Sharing and obtaining information related to emergency care
Microsoft Teams	2 (25.0)	Meetings; lectures
LinkedIn	2 (25.0)	Sharing and obtaining information related to emergency care; professional networking
Telegram	3 (37.5)	Patient consultations, management/logistics (e.g., schedules and rotations); sharing case studies and other educational content; communicating with specific groups (e.g., national emergency care societies or specific types of providers within a unit);
Twitter	3 (37.5)	Emergency care education; staying up-to-date on emergency care trends and research, particularly information from other parts of the world
WhatsApp	8 (100.0)	Patient consultations, management/logistics (e.g., sharing staff schedules and coordinate referrals/receivals); sharing case studies and other educational content; communicating with specific groups (e.g., national emergency care societies or specific types of providers within a unit); staying up-to-date on new emergency care research
Zoom	4 (50.0)	Meetings; lectures

#### 4.5.4 Benefits of clinical social media use

All participants (n=8, 100.0%) expressed extremely positive and optimistic views on the use of social media in facility-based emergency care. One participant emphatically shared that,

“Of course, considering all the other risks, I think the benefits though outweigh the risk of not having information especially in this kind of age where things are very fast moving. We’ve got emerging diseases, we’ve got even disaster that can strike at any moment, and you need to have information on your fingertips.”

A number of benefits were shared, including social media’s utility for remote consultations, education and learning, and professional networking. The accessibility of large quantities of information in real-time was especially important to providers, with participants noting:

*“[Social media] is largely positive because there’s so much information there, and you’re able to get access to information quickly, and that’s always a positive in emergency care where time is critical.”*

*“Another benefit is the information, that it’s real-time and relevant education because it’s things that I’m seeing in my hospitals and it’s relevant to my setting.”*

Another participant emphasised that social media removed boundaries that previously existed surrounding medical information:

*“It has allowed professional entities to connect, and it facilitates the free flow of information sharing. It is breaking down boundaries and bridging us together worldwide.”*

Participants were particularly passionate about its implications in LRS, where there are not enough specialist Emergency Physicians. One physician stated:

*“I will speak first from the point of view in a low resource setting, where we have quite a significant lack specialists. We're quite busy, and we can't be there all the time when our patients need us. Social media has come to assist us to be able to provide a service, a guidance, wherever it is needed via this telemedicine, through the social media platforms...So that has helped us be present, even if we are not there in physical situation to provide some assistance. So that's the one side of social media in the low resource setting.”*

Another participant shared similar sentiments surrounding the impacts of social media on emergency care in LRS:

*“Especially in these low resource setups like ours, where we have one emergency physician the whole hospital or should we say the whole town, and the next emergency physician is in another city...It makes life easier because you can quickly get the information and it's just about the information access.”*

Another participant highlighted the utility of social media in shared decision-making, stating:



*“We can reach out to many places without being there. And also it gives us timely intervention despite the distance, previously we used to spend a lot of money moving patients from one area to another because of lack of communication. But now before a person refers a very sick patient, that patient gets discussed on a forum. We get input together with other specialists and then we decide whether it's really necessary to have that person transfer from one facility which is far - maybe 300, 400 kilometres from the main hospital. It has helped us to cost save, yes, we spend in terms of bandwidth, internet, but when you look at overall patient movements, we have reduced significantly.”*

This shared decision-making allowed for a reduction in transfers at that participant's facility, generating cost- and time-savings and, according to the participant, improving patient outcomes.

One participant reflected on the potential benefits of social media for diagnostics:

*“There's huge potential in social media platforms, like WhatsApp or Telegram, that can enhance diagnosing x-rays or a scan or ECG.”*

Social media had particular benefits during the COVID-19 pandemic, when already-overworked providers were stretched thin, and staff needed to reduce exposure to one another. Four participants (50.0%) said that remote consultations were used in place of in-person consultations during the pandemic. Three participants (37.5%) also said that all medical education was moved to remote platforms such as Zoom and Microsoft Teams during this time, and one (12.5%) noted that this trend of online learning has persisted even as the pandemic subsided.

#### 4.5.5 Risks of clinical social media use

Participants openly shared that the benefits to social media did not come without simultaneous risks to both patients and providers. Patient confidentiality was of primary concern and was mentioned by seven of eight participants (87.5%). One interviewee shared that, despite having techniques in place to protect patient privacy, they were still concerned about information being leaked.

*“The threat that's there is that it's very difficult to keep patient confidentiality. Even though we do discuss patients as de-identified, using only initials or a number, and we don't mention the actual names. But, somehow, we get to know who the patient is. And we don't have control on who is sharing what we are sharing on the main groups. So I am concerned that patient information can get out, especially now places where law as far as patient data record keeping is concerned. Our protocol is a bit weak; that worries me.”*

The security risks were also highlighted:

*“I think one of the risks is, we all know ... your phone can get hacked and someone can start sharing all that information outside.”*

There were also concerns about losing information that may have been stored on WhatsApp and not captured in permanent medical records. One participant noted,

*“You can actually lose the information, the valuable information. You've got so much information on your WhatsApp and everything. And once you lose that phone you lose a*

*lot of information about your previous patients and what you learnt and what you shared.”*

Providers also had concerns about the responsibility they held in sharing information, particularly if that information were to end up in the wrong hands. A participant said,

*“You are responsible for someone else taking [the photos and videos] and discussing them with someone who’s going to take the videos where you don’t want them to go.”*

#### **4.5.6 Existing guidance on social media use**

Upon being asked about existing policies to govern social media use, the majority of participants (n=6, 75.0%) first noted that their medical training and the oaths that they took when becoming healthcare providers. As one participant stated, *“It’s just a rule that we know, and we follow as medical practitioners.”*

Only one participant was able to pinpoint a formal workplace policy on social media use:

*“So for my workplace it’s a written rule that you can’t share sensitive information on social media applications. It’s something we have in the contract, yes.”*

Another noted that, while there was no law specifically governing social media use in clinical settings, their country had a policy related to sharing patient data.

*“Even when we’re giving physical presentations where patients are discussed, we don’t give the full details of patients. As a country, it’s not allowed to give patients’ specifics.”*

*We can just add maybe patients' initials and the age but nothing beyond that. This rule is not just for social media, but for all information that we share, even research."*

In most cases, there were no policies to guide the use of social media in clinical settings at the facility- or government-levels, and providers had to abide by their own ethical standards:

*"There are no communication policies, but we stick to the confidentiality in the groups and also just our internal ethical standard of conduct."*

One participant said that, while their facility and country did not have any formal guidelines, they and other leaders in the EU had taken it upon themselves to put rules in WhatsApp groups. The main rule was that patients needed to be deidentified, although they did allow use of patient initials in place of names. The administrators enforced these rules and removed any messages containing identifiable information as quickly as possible. It was shared that it was sometimes challenging to enforce in real-time, because the WhatsApp group administrators were also clinicians and could not be available 24 hours a day to review group content.

#### **4.5.7 Barriers to social media use**

Internet accessibility and reliability were, by far, the more prominent barriers to social media use. Internet challenges were noted in seven interviews (87.5%). In six instances, this was noted as a real issue that the participants and their colleagues faced on a daily basis. In one case, it was shared as a conceptual issue that the participant felt was likely limiting wide-scale social media use in African emergency care.

Three participants (37.5%) expressed concerns about the affordability of internet access, with one stating:

*“Access to internet and the pricing of these internet services are something to look at and I think that fundamentally this is what I see as a barrier to this activity. Because almost everybody has a WhatsApp platform. The question is, does everyone have access to affordable internet at all?”*

Another noted that, even when internet was accessible, the government occasionally blocked social media websites and applications. This participant noted that this caused major challenges when communications had been set up on one platform, and then that platform was blocked.

Another barrier, mentioned by two participants (25.0%), was the nascency of emergency care. One participant said that, while the general infrastructure for social media existed, the emergency care community was not yet big enough to have large-scale impacts:

*“The infrastructure, in terms of internet, mobile phones, people using social media, all of that is there, but you need a bigger community for that. And that will take time. So it seems like time for development of the emergency care community is the key factor that’s limiting [social media use in clinical settings] right now.”*

Another participant indicated that the department they worked in was extremely young, having only been formed in the past two years. Because of this, it was not well-organised, which limited its capacity to define and control processes such as social media use.

#### 4.5.8 Recommendations to enhance social media use in emergency care

Participants were excited to discuss the potential means by which social media use in African emergency care could be enhanced.

Generally, there was optimism about natural growth, with participants noting that social media was nearly ubiquitous in medical training and younger generations of healthcare providers did not know a world in which healthcare did not coexist with social media. One said,

*“Most people use mobile phones. Most people use social media and the internet. These connections are laying the foundation for emergency medicine ... I think the use of social media for different purposes, like for transfer of images, consultation or building teamwork, communication, ... all of that will come naturally.”*

The potential for social media to highlight gaps in emergency care across the continent was emphasised by several participants. One said, *“We can understand what challenges [my country] is having, what challenges [other countries] are having. We can have focal points in every area and use the focal points to map the resources. We can also use them to map the opportunities and also weaknesses from whichever region we are.”*

The need for additional research was mentioned by three participants (37.5%). Participants said that the benefits and risks of using social media in facility-based emergency care in Africa needed to be systematically assessed through sound research studies. It was noted that research was essential to inform any protocols that are developed to guide the use of social media. It was also suggested that cost-effectiveness research be conducted, to assess the impacts of social media on costs in LRS.

There were several calls for standardisation of how emergency care providers are using social media, both within facilities and societies. One participant noted that, at the time of interview, their emergency care society was posting similar information on several platforms. Within each platform, useful and unique conversations were taking place regarding the posts. But, because information was spread across platforms, it was challenging to keep up with all of the important points being made. This participant suggested that organisations stick to one or two social media platforms, and that specific use cases are defined for each platform, so providers know where to go to meet their needs. Another interviewee noted the need for guidance on what applications are best suited for LRS African emergency care settings. As an example, the participant described how ineffective video calls are on Zoom, because it requires higher bandwidth which, if accessible at all, also comes at a higher data usage rate.

In one country, a participant noted that the national emergency care society was behind the ball on using social media, and that larger bodies should encourage national societies to leverage social media to reach members. This participant said they would like to see consistent updates from their society (e.g., weekly or daily posts relating to certain topics), instead of sporadic and unpredictable posts. They noted that short advocacy documents would be very helpful to bring societies, governments, and healthcare administrators up to speed on how and why their providers are using social media.

Finally, one participant suggested that having channels and groups with only verified members (i.e., those that have proven to administrators that they are licensed emergency

care providers) would increase the reliability of obtaining information via social media and reduce the risk of misinformation.

## **4.6 Discussion**

In this chapter, the successful implementation of a cross-sectional survey of facility-based emergency care practitioners in Africa is documented. The study describes a small but representative group of African emergency care providers' social media use, highlighting the perceived value of social media in their clinical practice and key areas for further research. This study provides what is, to our knowledge, the first-ever study of the use of social media in both African emergency care and more broadly in LRS.

### **4.6.1 Participant characteristics**

Although participants in this study hailed from just four countries, all of these countries were considered lower-income. This is important, as this work sought to describe social media use in true LRS.

Nearly all participants were specialist Emergency Physicians and half were heads of their respective EUs. Many African nations currently lack emergency care specialty training programmes, meaning that most of these providers likely went to a country with more developed emergency care infrastructure to complete training.<sup>163</sup> This process likely led to these providers having broader emergency care professional networks, hence their identification for inclusion in this study. They may be inherently more connected to social media, and their responses may not be reflective of non-specialist providers working in EU settings. Similarly, most of these providers worked in large urban hospitals, and results may not represent those working in smaller, more rural facilities.



Of note is that this study did not capture some demographic details of participants. Age is of particular significance, as younger generations tend to use social media more heavily in all aspects of their lives. All participants did, however, also take the survey described in Chapter 3. The overall age of survey participants was low, at 34 years, and it can be inferred that interview participants were similarly aged.

#### **4.6.2 Prevalence of use of social media platforms**

Overall, participants expressed frequent use of social media in both their personal and professional lives. The prevalence of use of specific social media platforms was slightly different in the context of participants personal versus professional lives. All participants used WhatsApp and Facebook in personal settings, which is unsurprising given that these are two of the largest and fastest-growing platforms worldwide.<sup>24 18</sup> WhatsApp was also used professionally by all participants, yet Facebook was not. This finding may suggest that the on-the-job needs of African emergency care providers are better met by a simpler messaging and content-sharing application like WhatsApp, as opposed to a larger, more multifunctional site like Facebook.

Some applications, such as Snapchat and TikTok, were reported for personal use but not professional use. This was somewhat expected, as both of the aforementioned applications are heavily marketed towards connecting with friends.<sup>262 263</sup> There were other platforms, including Microsoft Teams, LinkedIn, and Zoom, that were only mentioned in professional contexts. All of these sites are purpose-designed for work-related needs and communications.

#### **4.6.3 Use cases for social media in clinical settings**

These interviews elucidated a broad range of use cases for social media in clinical emergency care. Responses suggested that social media had numerous roles in improving how LRS providers are delivering emergency care.

As was the primary goal of this study, interviews provided useful insights into how social media was being used for point-of-care purposes in the African emergency care setting. These findings aligned with existing evidence found in Chapter 2's scoping review: Every point-of-care use case described by participants was for real-time consultation, including imaging reviews. Real-time consultation is an essential point-of-care tool in LRS for several reasons. Healthcare staffing shortages are common, particularly in lesser-developed fields like EM, and specialty skills training is limited. The few providers that do have appropriate training cannot reasonably be expected to be on facility grounds at all hours, and social media allows for them to be reachable when they are not. In the context of emergency care, where reducing time-to-care is critical, real-time consultations via social media platforms are likely making a tangible impact on patient outcomes. It is essential that these impacts are studied. Simultaneously, the effects that constant availability has on consulting providers should be assessed, as it is likely that the providers that are being contacted off-hours feel some strain.

Interestingly, participants did not mention that they used social media to look up pertinent skills or clinical information in real-time while caring for patients. This is likely due to the fact that it is challenging to quickly search and identify reliable information on these sites, in comparison to a search engine such as Google. Providers may also be hesitant to trust information unless they fully understand its source. As was suggested by one participant,

a process to verify people and content related to emergency care – perhaps by having verified groups – could help to expand access to reliable real-time information.

Although beyond the scope of this dissertation interest in point-of-care social media use, education was a second resounding theme in these interviews. Participants shared that social media was used both formally and informally to learn about, and instruct on, emergency care. In formally settings, social media was described as a lifeline for carrying on with routine medical education during the COVID-19 pandemic.<sup>264</sup> Multiple participants shared that platforms like Zoom and Microsoft Teams were used to provide training lectures for both medical students and specialist trainees. Without these platforms to leverage, it is likely that most medical education – including emergency care-specific training – would have ceased during the pandemic due to social restrictions. In LRS, where education is already limited, such a halt could have had devastating impacts. While these interviews only provide anecdotal descriptions of how this was prevented, they support that social media played a crucial role in the continuity of medical education during the pandemic.

Less formally, providers described a range of means by which they used social media to stay up-to-date on emergency care content. It is important to consider the background of participants included in this study. Nearly all of the participants in this survey were Emergency Physicians with specialist training, but their training does not reflect the reality that most healthcare providers in African EUs are not specialty-trained.<sup>163</sup> If Emergency Physicians with several years of intensive emergency care training are noting that they rely heavily on social media to continue their emergency care education, then non-specialty trained providers are likely using it as much or more for the same purpose.

A final key use case for social media that was shared by several participants was its utility for professional networking and connection. The presence of national and continental emergency care societies has been steadily growing over the last decade.<sup>265</sup> Many of these societies offer annual conferences; however, such meetings can be hard to reach for the many providers in more remote areas and those that have limited financial means. Through social media, societies are able to connect providers with similar backgrounds in restricted groups and channels. Providers can then share resource-appropriate information with one another. Social media also allows for a longitudinal connection, versus meeting once in person each year and not communicating the rest of the time. Based on these interviews, there is no doubt that social media is one of the driving factors for emergency care's growth on the African continent.

#### **4.6.4 Perceptions of clinical social media use**

This study provided deep insights into how African emergency care providers perceive social media use in the clinical setting. It highlighted both the risks and benefits of its use. Generally, despite noting a number of concerns, participants had positive views of social media use. One provider shared a particularly insightful comment, noting that the challenges that African emergency care providers face on a daily basis simply necessitate the need for social media's use. This is true: The African continent has what is known as the "triple burden of disease," meaning that the continent faces extremely high rates of injury, infectious disease, and noncommunicable disease simultaneously.<sup>266</sup> These countries are more prone to natural disasters than other regions of the world, and protracted conflicts – which generate both injury and disease – are more common.<sup>267 268</sup> In face of these challenges, African emergency care providers are leveraging every available resource – including social media – to improve the care that they provide.

A key benefit described by participants was that social media allowed for shared decision-making in several aspects of clinical care. Providers were able to receive real-time feedback on how they would care for patients, including choices like what medication to provide or if a patient required transfer to another facility. Shared decision-making has been evidenced to both improve outcomes and reduce costs.<sup>269</sup> Furthermore, its use is becoming popular in high-risk clinical encounters, most of which are emergencies<sup>270</sup><sup>271</sup>.<sup>272</sup> In LRS, where financial and physical resources are strained, it could likely have positive impacts on the overall emergency care system. However, shared decision-making via social media has not been studied in any depth, and additional research on this specific topic is needed.

In tandem with their effusive praise of social media's benefits to their clinical practices, participants also expressed concerns related to patient privacy and data security. These concerns are valid: Social media accounts are often hacked, with account breaching across all common social media platforms increasing 13% between 2019 and 2021 alone.<sup>273</sup> This means that information from even the most restricted and well-managed social groups or channels could be at risk. Guidance from healthcare institutions and governments is essential to protecting healthcare providers and patients alike, but it was noted to be limited in the African emergency care context. In most interviews, participants shared that they were operating under their own ethical principles and interpretations of the oaths that they took when becoming healthcare providers. In order to fully realise the benefits of social media in African emergency care, clear guidance, potentially including legal regulations and internal protocols, will be essential.

#### **4.6.5 Means of enhancing social media use in African emergency care**

A natural progression of the risks noted in the previous section is that the development of institutional and governmental guidance would allow for better use of social media in emergency care. Guidance is critical for several reasons. It would allow providers to feel more comfortable and confident in using social media in their daily practice, knowing that they are abiding by predetermined rules for its use. This, in turn, would protect providers from any legal recourse that could arise from data breaches. Patients will also see greater protection of their data when all providers have to follow the same guidelines for confidentiality measures. Guidance is needed soon, as social media use is clearly frequent in the African emergency care setting. This process should not, however, be rushed. The legal risks of social media use in healthcare could frighten institutions tasked with creating guidelines. In order to ensure a measured approach is taken, and social media use is not outright banned, advocacy documents and research supporting its value in LRS settings will be essential.

Infrastructure is also essential to enhancing social media use in the African emergency care setting. Participants noted that the availability of smartphones to access social media applications was not a problem in their settings. What was a problem, however, was internet access. Two factors were noted as problematic: internet connection reliability and cost. It was expected that connectivity challenges would be brought up in these interviews. Although internet availability via cabled connections has increased drastically across Africa in the last two decades, most Africans rely on mobile data to access the internet.<sup>274</sup> Therefore, reports depicting the accessibility of internet on the continent using maps of fibre cables may not be wholly representative of access. In order to genuinely improve access, particularly in rural areas, an estimated 250,000 additional cellular

towers are needed.<sup>274</sup> Unfortunately, this problem is systemic, and the best step for emergency care providers and organisations is to advocate to governments for further investments in cellular infrastructure. Providers can also consider using social media platforms on desktops that use wired internet connections, but this does remove much of the location flexibility that was noted as a benefit of social media use on smartphones.

#### **4.7 Limitations**

There are several factors that may limit the utility and generalisability of this study's results. First, this study relied on a non-probability sampling strategy, and a heavy focus was placed on capturing providers specifically in LICs and lower-middle-income countries. All participants were ultimately identified via responses to the survey described in Chapter 3, and some participants were unable to participate due to availability issues. This study may be missing representation from entire groups of African emergency care providers who are more isolated and not presently connected to global emergency care networks. The fact that all participants came from large hospitals that provided referral and tertiary care services suggests that emergency care providers at front-line hospitals are not well-represented. In future studies, further efforts should be made to recruit participants from such facilities.

Language barriers may also have limited the communication that occurred during interviews. Although translators were offered, all participants chose to participate solely in English. English speakers, as English is the medium used for publicising and disseminating opinions and outputs across practice settings on much of the continent. A bias may have been introduced, however, by exclusion of participants who could have provided good insight but had a poor grasp of spoken or written English.

Another limitation that played out in this study was the lack of video use during interviews. Given the geographical spread of providers across the large African continent, in-person interviews were not considered for this study. It would have been useful, however, to see the facial expressions and other visual cues of participants in real-time on interviews. Unfortunately, the bandwidth issues inherent to internet on the continent (and highlighted by participants themselves when describing barriers to social media use) did not allow for video interviews. The interviews were conducted with only audio, and the researcher had to rely on audio cues such as pauses and changes in intonation.

Sometimes, qualitative studies run risk of bias due to leading questions. Such questions may be inherently leading as written in the facilitation guide or may be vocalised in a leading way by the interviewer. This study had an experienced qualitative researcher review the questionnaire prior to interviews, to help to identify and address potentially biased questions.<sup>251</sup> This allowed the interviewer to be prepared and avoid bias during the interview process. The interviewer (the PhD candidate) is an emergency physician with experience in the African setting; this intimate knowledge of the setting that interviewees could potentially introduce bias, as the interviewer is invested in seeing this specialty succeed.

#### **4.8 Conclusions and next steps**

The non-linear process by which interviews were conducted, with content analysis occurring between interviews to mould the interview approach until saturation was reached, allowed for meaningful insights into exactly how and why African emergency care providers are using social media. This study provided a more nuanced view of social media use cases than the qualitative survey in Chapter 3 was able to provide. African



emergency care providers are using social media for point-of-care, education, and professional networking purposes, and they see clear benefits to its use. They did, however, note substantiated concerns about the risks it poses, both to themselves and their patients.

Providers showed strong interest in institutional and governmental guidance on how to use social media. Regulations on social media use should be developed using a measured approach. The evidence supporting social media use in African emergency care should be presented, so as to build a case for the benefits outweighing the already-documented risks.<sup>113</sup> This study also suggests that some organisations, including healthcare facilities and emergency care societies, have been slow to adopt social media. Concise advocacy documents outlining the rationale and evidence for social media use in emergency care will be essential to bringing these stakeholders on board.

## **Chapter 5: Discussion of thesis**

This dissertation represents multiple years of work towards advancing the understanding of how social media is being used as a point-of-care tool in African emergency care. Its results provide a nuanced view into African emergency care providers' social media use and generated multiple implications for the current and future use of social media in LRS emergency care.

### **5.1 Main findings**

#### *Existing evidence base*

A scoping review was conducted to understand how social media was being used as a point-of-care tool in facility-based emergency care. The scoping review was broad, with no geographical restrictions, and a range of terms were used to capture social media platforms and the emergency care field. Despite this breadth, the review identified only an extremely limited evidence base. Studies focused only on the WhatsApp platform, despite this being only one of many specific platforms included in the search strategy. Most studies were from upper-middle-income countries, and no LICs were represented in the literature. Research objectives were primarily targeted at the diagnostic power of WhatsApp and the impact of the platform on consultations; there was no evidence on the safety and security of real-time social media use in emergency care. There is a massive gap in research related to point-of-care social media use in emergency care globally, and additional research is needed. The available evidence did, however, highlight that WhatsApp has sound diagnostic power, and that its use in consultations care improve a number of patient care metrics.

### *Use of social media by African emergency care providers*

Findings of the survey and interviews conducted for this dissertation make it clear that social media use in this group is nearly universal. In addition to personal use, most emergency care providers reported using social media multiple times each day in their clinical practice. These providers agreed that social media was positively benefiting both patient and provider experiences, with many anecdotes that social media use can improve the speed of patient care while reducing costs. Of note is that some providers saw little-to-no-risk in social media use. While this group was a minority, they were not insignificant in number and spanned the range of provider education levels. This finding is important and suggests a strong need for provider education on the hazards of social media.

### *Barriers to social media use in African emergency care*

Although African emergency care providers that participated in this work were consistently using social media for professional purposes, they noted a key challenge to its use: Internet connectivity. Social media is largely accessed through mobile applications, which require stable cellular data connectivity to function as a point-of-care tool. Internet connectivity was most problematic when video conferencing was used and less of a challenge if providers were simply sharing images or text. However, it was noted that, in the context of emergencies, seconds matter, and mobile data lags could impact patient outcomes even when using low-bandwidth methods. A lack of guidance on safe use was also a commonly-shared barrier to social media use. While the absence of protocols did not prevent any participants from using social media outright, concerns about how they should be using platforms for clinical purposes did lead to limited engagement for some.

### *Potential use cases for social media in African emergency care*

In establishing the evidence for the use of social media as a point-of-care tool in facility-based emergency care, this dissertation has identified a number of key use cases for social media in the African setting. The primary finding, noted in interviews and substantiated by evidence identified in the scoping review, was the utility of social media for real-time provider consultations. Every point-of-care situation described by respondents was for consultation purposes, and most described WhatsApp as their application of choice for these consults. A secondary but commonly mentioned use case was for emergency care education purposes, including both formal medical education and informal continuing education. Participants also noted the usefulness of social media in staying professionally connected, via both networking sites and emergency care society groups. Such connectivity, for both education and networking purposes, is of key importance in the geographically spread continent of Africa.

Table 5.1 summarises these findings and provides a preliminary model for social media use in African emergency care. It describes key social media use cases found in this work, the platforms being used for these purposes, and any existing supporting evidence for use. It then describes the barriers and facilitators mediating the use case and provides actionable recommendations to further enhance social media use for these purposes. This preliminary model will be used as a starting point for post-doctoral efforts to develop an in-depth framework to guide the use of social media in African emergency care.

**Table 5.1:** An emerging model for social media use in African emergency care

Social media use case	Primary social media platforms	Evidence supporting use	Factors mediating use	Potential strategies to enhance use
Point-of-care consultations	<ul style="list-style-type: none"> <li>WhatsApp</li> <li>Facebook</li> </ul>	<p>All available evidence related to point-of-care consultations being conducted via social media focused on the WhatsApp platform. Across 12 studies, WhatsApp was shown to 1) significantly reduce consultation time, and 2) facilitate consultations without loss of diagnostic power.</p>	<p><i>Barriers</i></p> <ul style="list-style-type: none"> <li>Risks to patient and provider confidentiality</li> <li>Potential loss of historical information if devices are lost/stolen</li> <li>Connectivity/bandwidth</li> <li>Data use costs (particularly for video consultations)</li> <li>Governments intermittently blocking social media sites</li> </ul> <p><i>Facilitators</i></p> <ul style="list-style-type: none"> <li>Applications are free and readily accessible</li> </ul>	<ul style="list-style-type: none"> <li>Develop guidance for safe use of social media as a point-of-care tool</li> <li>Advocate for the development of policies/laws formalizing legal use of social media in emergency care</li> <li>Develop and provide trainings on appropriate social media use in clinical settings</li> <li>Establish baseline evidence for the use of other social media applications as consultation tools, beyond WhatsApp</li> <li>Advocate to governments on the necessity of social media access for professional purposes</li> </ul>

Social media use case	Primary social media platforms	Evidence supporting use	Factors mediating use	Potential strategies to enhance use
Emergency unit management/ logistics	<ul style="list-style-type: none"> <li>WhatsApp</li> <li>Telegram</li> </ul>	Beyond the scope of this dissertation*	<p><i>Barriers</i></p> <ul style="list-style-type: none"> <li>Potential loss of historical information if devices are lost/stolen</li> <li>Security risks</li> <li>Concerns of hacking</li> <li>Connectivity/bandwidth</li> <li>Governments intermittently blocking social media sites</li> </ul> <p><i>Facilitators</i></p> <ul style="list-style-type: none"> <li>Applications are free and readily accessible</li> <li>Easy access to important information without the need to log into a separate system</li> </ul>	<ul style="list-style-type: none"> <li>Encourage use of a singular platform to transmit important logistical information</li> <li>Develop guidance on appropriate use of social media to transmit sensitive facility and employee information (e.g., safety plans and employee schedules)</li> <li>Advocate to governments on the necessity of social media access for professional purposes</li> </ul>
Continuing education	<ul style="list-style-type: none"> <li>Twitter</li> <li>Facebook</li> <li>Instagram</li> </ul>	Beyond the scope of this dissertation*	<p><i>Barriers</i></p> <ul style="list-style-type: none"> <li>Connectivity/bandwidth</li> <li>Data use costs (for video content)</li> <li>Governments intermittently blocking social media sites</li> <li>Concerns about integrity of sources (e.g., outdated or falsified information)</li> </ul> <p><i>Facilitators</i></p> <ul style="list-style-type: none"> <li>Applications are free and readily accessible</li> <li>Obtain up-to-date information from other parts of the world</li> </ul>	<ul style="list-style-type: none"> <li>Develop guidance on assessing the integrity of information sources</li> <li>Integrate free open-access medical education (FOAMed) into formal medical training curricula</li> <li>Advocate to governments on the necessity of social media access for professional purposes</li> </ul>

Social media use case	Primary social media platforms	Evidence supporting use	Factors mediating use	Potential strategies to enhance use
Professional networking	<ul style="list-style-type: none"> <li>Facebook</li> <li>Twitter</li> <li>LinkedIn</li> </ul>	Beyond the scope of this dissertation*	<p><i>Barriers</i></p> <ul style="list-style-type: none"> <li>Connectivity/bandwidth</li> <li>Governments intermittently blocking social media sites</li> </ul> <p><i>Facilitators</i></p> <ul style="list-style-type: none"> <li>Applications are free and readily accessible</li> <li>Provides connection for those that may not be able to travel to conferences</li> </ul>	<ul style="list-style-type: none"> <li>Professional organizations should consolidate groups across networks and concentrate on preferred platforms</li> <li>Ensure groups are “closed” and membership is verified</li> <li>Advocate to governments on the necessity of social media access for professional purposes</li> </ul>

\*Note: This dissertation’s focused primarily on social media use in point-of-care encounters, and other use cases were not researched in the scoping review. These uses did, however, arise in natural conversation during the qualitative interview phase.

## 5.2 Future work

### *Recommendations for implementation*

This dissertation generated a number of actionable steps that can be implemented to enhance social media use in the African emergency care setting. An important next step following the completion of this dissertation will be to publish the research conducted for the PhD. All efforts will be made to publish findings of this work in open-access journals, so LRS providers can easily access it.

It is also crucial that the findings of this work be shared with a broader audience of healthcare stakeholders, including healthcare institutions (e.g., hospitals and medical universities) and government Ministries of Health. For these audiences, who are often non-scientists, medical journal publications are typically not the appropriate means of communicating new findings. Advocacy documents, which are simple and easy-to-read, with little scientific jargon, will be created to advocate for the use of social media in African emergency care. These documents will highlight the risks and benefits and motivate for the development of guidelines to inform the responsible use of social media. Documents will be purposefully designed for specific audiences, such as governments, emergency care societies, and healthcare administrators. These briefs will be designed and distributed in collaboration with AFEM stakeholders, to amplify their reach.

In the absence of existing guidelines to govern the use of social media in emergency care, African providers are in clear need of education on the known risks and benefits of its use. In conjunction with AFEM, educational resources will be developed that highlight the hazards of social media use and provide practical tips for safe use. These materials will



be disseminated to African emergency care providers via AFEM's membership base, and educational seminars could also be hosted at the society's biannual conference.

Finally, survey and interview responses afforded actionable insight into the most effective means by which emergency care organisations can communicate with their membership. WhatsApp was overwhelmingly the most common platform for both professional and personal use in participants studied for this work. Groups that are seeking to share and connect with African emergency care providers should focus on this platform above others when considering how to effectively communicate with and grow their bases.

#### *Recommendations for future research*

Work presented in this dissertation also identified several areas for future research. The salient takeaway from this work was that, while social media was heavily used by emergency care providers in LRS, there were few guidelines to govern its safe use in their clinical practice. In fact, most participants in Chapter 4's interviews stated that they had no institutional protocols available to guide their social media use; instead, they relied on their own internal ethics and morals to determine appropriate use. It is essential that clear guidance is developed surrounding social media in clinical emergency care, to protect both patients and providers from potential misuse. Contextually appropriate evidence is needed to inform such protocols, so that officials can weigh the pros and cons of social media use and develop a measured approach.

However, this dissertation's scoping review established that, to-date, no studies have explored the effectiveness of social media on real-time emergency care in LICs or lower-middle-income countries. This is a substantial knowledge gap, and one that must begin

to be filled prior to developing appropriate guidelines. Social media is already being used in LRS emergency care settings, and researchers should consider studying this use in real-time to document its effectiveness. Randomised controlled trials would generate the best evidence; however, these trials are costly and difficult to conduct in resource-strained settings. Instead, researchers in LRS can likely use retrospective studies and existing patient data to gauge the cost- and time-effectiveness of point-of-care social media use.

The methodology described in this dissertation, specifically the survey and interview processes, could be replicated in other populations to further the evidence base of social media use in African emergency care. For example, this study was limited to facility-based emergency care. Emergencies, however, occur in all settings, and care is often provided outside of facilities to stabilise patients. Providers practising in prehospital settings, such as ambulances and EMS, should be examined in a similar way to understand social media use in those spaces. This dissertation focused almost exclusively on medical doctors providing facility-based emergency care in the African setting: All survey participants were physicians, and all but one interviewee was a physician (one interview participant was a nurse with specialty emergency nursing training). Medical doctors were targeted for this initial research because physicians tend to be the clinical decision makers in most facility-based emergency care settings throughout Africa. The majority of healthcare providers in Africa are non-physicians, and the continent has approximately 1.2 million nurses in comparison to 300,000 doctors.<sup>275</sup> To gain a fully-representative picture of social media use in African emergency care, it is essential that that nurses and other non-physicians are also studied in future efforts.

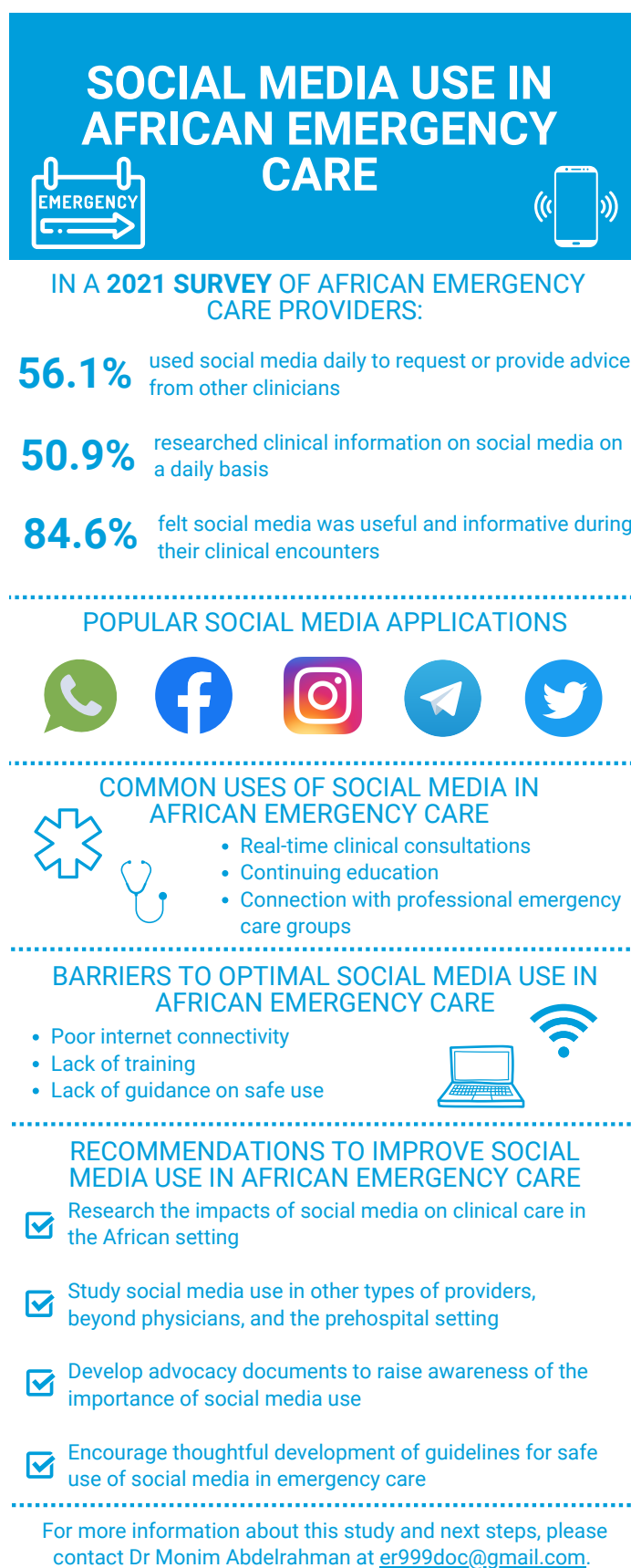
Although beyond the initial scope of this dissertation, a topic that came up frequently in the available literature, as well as interviews and surveys, was the use of social media for educational purposes. Social media was noted to be used in formal medical education, and it was particularly beneficial during the COVID-19 pandemic, when in-person teaching was paused.<sup>276</sup> There is also a major trend in the informal continuing education practice known as FOAMed.<sup>277 278</sup> FOAMed refers to the freely-available medical education content and discussions that are occurring largely via social media platforms, particularly Twitter, podcasts, and microblogs.<sup>279</sup> This movement was established in 2012 by those in academic emergency care to bypass traditional barriers to accessing educational content, such as peer-reviewed publications and textbooks.<sup>279 280</sup> This model has been revolutionary for medical education across the globe, especially for trainees and providers with limited access to pay-to-view materials.

For LRS, this trend towards leveraging open-access materials to further one's medical education has been revolutionary, since there are no costs associated with it other than internet access.<sup>281</sup> FOAMed also created opportunities for bi-directional knowledge exchange: In addition to rapid translation of information from higher-resourced settings, clinicians are also able to share research and experiences from any setting. Work in-low resource settings is more likely to go unpublished but FOAMed allows these ideas and information to be disseminated globally, even in the absence of formal publication.<sup>282</sup> The cost- and time-effectiveness of FOAMed initiatives suggest that it has the potential to aid in training emergency care providers. This, in combination with participants' clear interest in these educational tools, motivates further research on the subject.

### *Shareable infographic*

As a preliminary step towards disseminating the findings of this work and improving social media use in African emergency care, an infographic has been developed.

**Figure 5.1:** Infographic for social media use in African emergency care



### **5.3 Conclusion**

This dissertation provides a first-ever in-depth description of social media use in African emergency care. It contains the views of 70 emergency care providers delivering facility-based care in 17 African nations, all of which are considered low- and middle-income countries. The existing evidence base for social media use in medicine is overwhelmingly generated in HICs, and these African providers have had little-to-no representation in previous literature. It is our hope that capturing and sharing these providers' perceptions and use of social media will generate important movement towards enhancing the use of social media in the African emergency care setting. Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting, based off of the preliminary model defined in Table 5.1.

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## APPENDICES

### Appendix 2.1: University of Cape Town study proposal (FHS015)

#### Form FHS015: Research Protocol – Section C

**Project title:** Evaluation of the use, outcomes, risks and benefits of Social Media in facility-based emergency care in low-resource settings: a scoping review

**Lead researcher:** Abdelmonim Abdelrahman (for PhD, student number: ABDABD024)

**Supervisors:**

1. Stevan Bruijns\* (PhD), Division of Emergency Medicine, University of Cape Town (principal investigator)
2. Hayfaa Wahabi (PhD), Department of Family and Community Medicine, King Saud University, Riyadh, Saudi Arabia

**Note:** This study is in partial fulfilment of the PhD in emergency medicine. It is the first in a series studies required for this purpose. Findings of this study are required to construct a meaningful proposal for the next, and so on and so forth (see Appendix A).

## **Abstract**

### *Introduction*

Although there is good evidence to suggest that social media is used in high-income countries to augment clinical care, it is not clear that this is the case in low- or middle-income countries. Anecdotally social media is used by African emergency care providers in clinical settings, but use, perceptions, risks, and benefits have never been described. It is the aim of this study to systematically map the available literature on the use, outcomes, benefits and risks pertaining to social media as a point-of-care tool as part of a scoping review.

### *Methods*

A scoping review will first describe the effectiveness, benefits, and risks of using social media as a clinical tool in global emergency care. We will set out to answer the following study questions: What social media applications are used as a point-of-care tools, for real-time clinical care by medical doctors in emergency medical or critical care? Does the use of social media, as a point-of-care tool, for real-time clinical care by medical doctors in emergency medical or critical care improve or provide equal patient-oriented outcomes compared to routine care (where routine care is defined as care not including the use of social media)? And what are the risks and benefits described, or associated with the use of social media as a point-of-care tool for real-time clinical care by medical doctors in emergency medical or critical care? We will search the following databases, Medline (1966- 2017), Embase (1980- 2017), Web of Science (Science citation index-1970-2017), Cochrane Library up to the latest issue 2017, Scopus through to 2017 and Google Scholar. Titles and abstracts will be screened by two independent reviewers. Copies of the full text of relevant studies will be obtained and their eligibility assessed independently by the two reviewers. Data will be extracted from the final selected full text papers for the key research question variables: use, outcomes, risks and benefits. Extracted data will be grouped in terms of use, outcomes, risks and benefits (with attention to strength of the narrative and date of publication noted within each group) to provide a logical framework. The PRISMA guidelines will be used to structure the findings in a narrative summary.

### *Ethical considerations*

No part of the current study will use social media within professional settings; but are simply descriptions of current practices to determine how various applications are used in clinical care using secondary data analysis. Risk of harm is therefore minimal.

## Background

Growing evidence suggests an important role for emergency care in accelerating progress on global health priorities and narrowing health disparities (1-5). The World Bank's disease control priorities project estimates that, of the 45 million deaths per year in low- and middle-income countries, 54% are due to conditions that are potentially addressable through prehospital and/ or emergency centre care (1). This translates to a staggering 932 million years of life lost to premature mortality, and over a million disability-adjusted life years (1). Despite this, emergency care has remained virtually absent from the global health agenda, as most initiatives (in low resourced areas in particular) have emphasised prevention, primary care, and vertical approaches to disease control.

This lack of prioritisation manifests in many ways within emergency care, not the least of which is a significant shortage of adequately trained facility-based staff to populate emergency centres (6,7). The majority of African countries have not recognised emergency medicine as a medical specialty in its own right, and the few that have, have only done so in the last decade (6). In either case, emergency centres are largely staffed by rotating or junior clinical personnel, who are often poorly equipped to handle the wide variety of acute presentations with the limited resources available to them (8). Educational and training opportunities are not accessible or inadequate, and access to best practice information or guidance is limited, particularly with regards to the low resource context in which these clinicians practice.

The internet is a powerful tool for education and for information sharing, and internet penetration rates and connection speed throughout Africa have seen dramatic increases in the last ten years. The continent's internet penetration rate in March 2017 was 26.9%, but this figure represents a 7330% increase between 2010 and 2017 (9). The number of Facebook users in Africa is estimated at approximately 150 million individuals (9). Despite these figures, compared to the rest of the world, internet usage rates are well below average – the global average penetration rate is approximately 49%, with high-income countries reaching well above 90% (9,10). And so, many African countries – particularly the lowest-income or those in conflict areas – have very low overall internet access and poor internet infrastructure (10). Interestingly, those African countries that are experiencing growth in broadband and mobile technology in particular appear to roughly correlate with the list of countries with active growth of emergency care systems and functionality. Ghana, Rwanda, Egypt, Sudan, Botswana, South Africa, Ethiopia, Tanzania, Uganda, Mozambique and Zimbabwe are currently the only countries out of 52 with established emergency medicine training programs (some for specialists and others for non-specialists) (8). South Africa has both the most developed emergency care systems on the continent, and one of the highest broadband and mobile internet usage rates (10,11). 4

With growth in internet use in general comes marked growth in the popularity of social media sites and applications, many of which are commonly used around the world by healthcare practitioners and students. For the purpose of this review social media is

defined as “The collective of online communications channels dedicated to community-based input, interaction, content-sharing and sometimes collaboration with other users in real time” (28).

In high-income countries, the use of social media by facility-based clinicians to inform healthcare decision making has been well documented (12-15). Different types of reported use by clinicians include finding and exchanging information, directly communicating or networking with colleagues, disseminating findings, participating in health advocacy, and marketing a product or practice (12,15). In addition, some use social media to directly interact with patients or to gather patients’ personal information when traditional sources of information are exhausted. A study of paediatric faculty and trainees in the United States, for example, found that 14% to 18% of trainees had conducted an internet or social media search for information about a patient, and 14% of faculty stated they would use the internet to determine necessary additional patient information (16). A 2009 study describing the effect of social media internet tools on junior physicians’ daily clinical practice reports Google and Wikipedia use by 80% and 70% of physicians, respectively (17). A 2013 systematic review identified six key overarching benefits of social media use in a clinical setting: (i) increased interactions with others, (ii) more available, shared and tailored information, (iii) increased accessibility and widening access to health information, (iv) peer/ social/ emotional support, (v) public health surveillance, and (vi) the potential to influence health policy. (18).

Physicians’ use of social networking as a tool to crowdsource answers to clinical questions has been of particular interest for this research, as it has the potential to enhance real-time clinical care in settings where other sources of information are limited or unavailable. Two examples of this application in the US healthcare system are Sermo ([www.sermo.com](http://www.sermo.com)) and Doximity ([www.doximity.com](http://www.doximity.com)) (19). Sermo is an online social networking community where “physicians across all 50 states in the US representing 68 specialties come to network, discuss treatment options, and curbside peers for expert advice whenever they need it.” (19) Doximity, a newer physician-only social networking community, allows users to search a database of healthcare providers, and supports point-of-care crowdsourcing via Health Insurance Portability and Accountability Act (HIPAA)-compliant messaging within this database (19).

While the potential benefits of social media in clinical practice are ample and described in observational studies in some settings, the limits and risks of this type of information sharing and seeking are even more highly considered (12, 15-18). Numerous institutional statements and practical guidelines have emerged as the social media landscape has developed, and many studies on social media use in healthcare include best practice recommendations (12, 20-25). A 2012 review of social media use by clinicians found that two types of risk are particularly pervasive and thus of concern: breaches of patient confidentiality and publication of unprofessional content (26). Other concerns include high levels of poor-quality information and lack of quality oversight, licensing issues, liability, and other legal grey areas due to the rapidity with which social media use is emerging

and evolving. Use of social media tools for physician education in emergency medicine care is under-reported. One study of the integration of social media into emergency medicine residency curricula surveyed 226 residents across 12 different US residency programs and found that 98% used some sort of social media learning at least one hour per week (27). However, the types of modalities described are limited to blogs, podcasts, and video casts, none of which are of much particular use in real-time clinical care. Other literature on social media and emergency care is sparse, particularly for one-on-one communication with other professionals or point-of-care information-seeking.

These particular types of social media use could have value in low-resource settings as a point-of-care tool where health education infrastructure cannot provide the level of support, mentorship, and information required to maintain best practice in clinical settings. Indeed, there is strong anecdotal evidence to suggest that it is already used extensively for this purpose within African emergency centres. However, an understanding of the prevalence, risks and benefits of social media use to inform front-line clinical emergency care in real-time lacks in this setting. Indeed, no study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa.

## **Motivation**

The potential of social media to improve health communication and health information sharing in the acute setting cannot be underestimated. Social media including its mobile applications are already informally in use in low resource settings to provide real-time, clinical support to emergency care providers, who otherwise lack adequate training or access to information. It is unlikely that this practice can be halted, despite objections from various corners. It may however be possible to provide guidance for safer use if the scope of use is better understood. This review will describe the benefits and risks pertaining to social media as a point-of-care tool to inform further studies on the prevalence, effectiveness, risks and benefits of social media use within the African context. Although the findings of the thesis at large will likely provide a number of avenues for further research, the focus would be to use the findings to provide a provisional framework or guidance for the use of social media in the clinical setting. 6

## **Aim**

It is the aim of this study to systematically map the available literature on the use, outcomes, benefits and risks pertaining to social media as a point-of-care tool as part of a scoping review.

This will be addressed as part one of a full doctoral thesis. Appendix A outlines the subsequent, planned studies, which will be finalised upon completion of this scoping review and submitted separately to ethics committed.

## **Methods**

### *Study design*



A scoping review of available literature will be performed to answer the following study questions:

1. What social media applications are used as a point-of-care tools, for real-time clinical care by medical doctors in emergency medical or critical care?
2. Does the use of social media, as a point-of-care tool, for real-time clinical care by medical doctors in emergency medical or critical care improve or provide equal patient-oriented outcomes compared to routine care? (Where routine care is defined as care not including the use of social media)
3. What are the risks and benefits described, or associated with the use of social media as a point-of-care tool for real-time clinical care by medical doctors in emergency medical or critical care?

#### *Inclusion criteria*

1. Randomised trials (including cluster and quasi randomised trials), and observational studies
2. Published in a peer-reviewed journal, conference proceeding or as an abstract (provided that a complete description of the trial or study is included for the latter two; all attempts will be made to find full text by contacting authors).
3. Written in English,
4. Contain primary empirical data or secondary data such as systematic or critical reviews,
5. The users of social media must be medical doctors practicing within an emergency or critical care setting irrespective of age or gender,
6. Any real-time consultation carried out by a medical doctor with the purpose of consultation pertaining to the management of patients in emergency or critical care disciplines (adults, 7 paediatrics and obstetrics), and
7. The effects on patient outcome are clearly stated.

#### *Exclusion criteria*

Will exclude the following from this review:

1. Non-clinical staff, laypersons, dentists and health care providers not operating in emergency or critical care settings, and
2. Conference proceeding and abstracts when there is no complete description of the trial or study.

#### *Search strategy*

We will search the following databases, Medline (1966- 2017), Embase (1980- 2017), Web of Science (Science citation index-1970-2017), Cochrane Library up to the latest issue 2017, Scopus through to 2017 and Google Scholar. Some of the search terms we will be using include: "social media", "clinical care", "emergency care", "low- and-middle income countries", etc. We will include specific applications as well, such as WhatsApp, Facebook, Twitter, etc.

### *Identification of included studies, data extraction and analysis*

All titles and abstracts retrieved by the electronic search will be screened by two independent reviewers, and the studies which clearly did not meet the inclusion criteria will be excluded. Copies of the full text of potentially relevant studies and trials will be obtained, and their eligibility will be assessed independently by two reviewers. Data will then be extracted from the final selected full text papers for the key research question variables: use, outcomes, risks and benefits. Narrative review and thematic analysis will then be carried out to address the research questions.

### *Outputs*

The extracted data will be grouped in terms of use, outcomes, risks and benefits (with attention to strength of the narrative and date of publication noted within each group) to provide a logical framework. It is our goal to present the findings in a publishable format. The PRISMA guidelines will be used to structure the findings in a narrative summary.

### *Ethical considerations*

No part of the study will use, or encourage the use of, social media in clinical or other professional settings; all parts of this research will provide simple descriptions of current practices surrounding the use of social media. Legal implications related to privacy and clinical risk should not be of concern in this review.

### **Limitations**

It is possible that there are not sufficient, high-quality studies available for inclusion in the review. This is the main reason why we decided to conduct a scoping review as opposed to a systematic review. This should help address the study questions to at least some extent and provide direction for further study using better quality studies. We appreciate that a bias may be introduced by exclusion of studies not in English, which may have provided good insight. That said we expect that the vast majority of research on social media would likely be in English.

### **Timeframe**

1. March – May 2017 EMDRC
2. June – July 2017 HREC
3. August – November 2017 Data extraction
4. December – February 2018 Data analysis and interpretation
5. March- May 2018 Write up of findings and dissemination

### **Budget**

(Budget costs are approximate where stated and will be covered by the study team)

Paper and printing R1000

Internet cost (for literature search) R1000

No other costs are anticipated at this stage.

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## **Appendix A**

The following is an outline of the studies related to the scoping review presented, showing how each will fit into the PhD.

### **Evaluation of the use of Social Media in facility-based emergency care in low-resource settings**

#### *Aim*

It is the aim of this PhD to describe the benefits and risks pertaining to social media as a point-of-care tool in the academic literature, as well as the prevalence, usage and perceived risks and benefits of social media as a point-of-care tool within the African context, and to use this information to describe a provisional framework for safe usage of social media in the local clinical setting.

#### *Objectives*

1. To describe, through a scoping review, the use, outcomes, benefits and risks pertaining to social media as a point-of-care tool for emergency or critical care globally.
2. To describe, through a survey (based on part findings from part 1), the prevalence of use, particular social media applications used, user demographics and specific usage of social media as a point-of-care tool for emergency or critical care by emergency care providers affiliated with an African academic facility providing postgraduate emergency care training, or the African Federation for Emergency Medicine (AFEM).
3. To describe through content analysis (based on part findings from part 2) the perception of the risks and benefits pertaining to social media as a point-of-care tool for emergency or critical care within the acute setting.
4. To describe through a survey (based on part findings from part 3) the perception of the risks and benefits pertaining to social media as a point-of-care tool for emergency or critical care within the acute setting.

Each of these objectives will be addressed in an individual part with the PhD aim providing the overall direction for the work.

#### **Proposed methods:**

Part 1: Scoping review

Part 2: Survey

Once the scoping review findings are available, we will be able to construct a self-reported, cross-sectional survey to describe social media usage, particular social media applications used, user demographics and specific usage of social media as a point-of-care tool for emergency or critical care by African emergency care providers

Part 3: Personal interviews

Once the Survey findings are available, we will be able to perform an exploratory qualitative study involving thematic analysis of in-depth, semi-structured interviews to gain an understanding of African clinicians' views, attitudes and behaviours towards social media use to enhance bedside emergency or critical care. In these interviews, we will explore what people use and why, how and when they use it. We will also explore the gained benefits of the social media use as well as the risks they attach to its use.

## **Conclusion**

The findings from the four parts will then be critically reviewed. The key findings will be highlighted and interactions between findings explored. Recommendations will then be presented based on the available body of evidence generated by this PhD and elsewhere.

**Appendix 2.2:** University of Cape Town Human Research Ethics Committee approval for  
“Evaluation of the use, outcomes, risks and benefits of social media in facility-based  
emergency care in low-resource settings.”



**UNIVERSITY OF CAPE TOWN**  
**Faculty of Health Sciences**  
**Human Research Ethics Committee**



Room E53-46 Old Main Building  
Groote Schuur Hospital  
Observatory 7925  
Telephone [021] 406 6626  
Email: [shuretta.thomas@uct.ac.za](mailto:shuretta.thomas@uct.ac.za)  
Website: [www.health.uct.ac.za/fhs/research/humanethics/forms](http://www.health.uct.ac.za/fhs/research/humanethics/forms)

03 July 2017

**HREC REF: 464/2017**

**Dr SR Bruijns**  
Emergency Medicine  
F51, OMB

Dear Dr Bruijns

**PROJECT TITLE: EVALUATION OF THE USE, OUTCOMES, RISKS AND BENEFITS OF SOCIAL MEDIA IN FACILITY-BASED EMERGENCY CARE IN LOW-RESOURCE SETTINGS: A SCOPING REVIEW-(PhD-candidate-Dr A Abdelrahman)**

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

**Approval is granted for one year until the 30 July 2018.**

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: [www.health.uct.ac.za/fhs/research/humanethics/forms](http://www.health.uct.ac.za/fhs/research/humanethics/forms))

**Please quote the HREC REF in all your correspondence.**

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval before the research may occur.

**The HREC acknowledge that the student, Dr Abdelmonim Abdelrahman will also be involved in this study.**

*Yours sincerely*

pp *T. Burgess*

**PROFESSOR M BLOCKMAN**  
**CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE**  
Federal Wide Assurance Number: FWA00001637.  
Institutional Review Board (IRB) number: IRB00001938

HREC 464/2017

**Appendix 2.3: Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist<sup>116</sup>**

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	32
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	No page number (beginning of dissertation)
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	32-34
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualise the review questions and/or objectives.	34
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	35
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	37-38
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to	36



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
		identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	36
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	37-38
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	39
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	39
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Not applicable
Synthesis of results	13	Describe the methods of handling and summarising the data that were charted.	40
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	41-42
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	43-45

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	43-73
Synthesis of results	18	Summarise and/or present the charting results as they relate to the review questions and objectives.	43-73
<b>DISCUSSION</b>			
Summary of evidence	19	Summarise the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	74-82
Limitations	20	Discuss the limitations of the scoping review process.	82-83
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	84-85
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	Not applicable

## Appendix 2.4: Search strategy

**Search date:** 01/12/2020, updated 01/11/2022

**Search limits:** 01/01/2010 to 01/11/2022, English only, publications only

Database	Search string	No. results
PubMed	(Emergency Treatment [MeSH] or Evidence-Based Emergency Medicine [MeSH] or Emergency Service, Hospital [MeSH] or Emergency Medicine [MeSH] or “Emergency Med*” [tiab] or “Emergency Care” [tiab] or “Emergency Department” [tiab] or “Emergency Unit” [tiab]) and (Social Media [MeSH] or “Social Media” [tiab] or “Social Network*” [tiab] or “Social Platform” [tiab] or “WhatsApp” [tiab] or “Facebook” [tiab] or “Instagram” [tiab] or “Twitter” [tiab] or “Telegram” [tiab] or “YouTube” [tiab] or “Smartphone” [tiab])	590
Scopus	TITLE-ABS-KEY(“Emergency Med*” or “Emergency Care” or “Emergency Department” or “Emergency Unit”) and TITLE-ABS-KEY(“Social Media” or “Social Network*” or “Social Platform” or “WhatsApp” or “Facebook” or “Instagram” or “Twitter” or “Telegram” or “YouTube” or “Smartphone”)	931
Web of Science	TS=(“Emergency Med*” or “Emergency Care” or “Emergency Department” or “Emergency Unit”) and TS=(“Social Media” or “Social Network*” or “Social Platform” or “WhatsApp” or “Facebook” or “Instagram” or “Twitter” or “Telegram” or “YouTube” or “Smartphone”)	712
Embase	(‘Emergency Medicine’/exp or ‘Emergency Care’/exp or ‘Emergency Department’/exp or ‘Emergency Unit’/exp) and (‘Social Media’/exp or ‘Social Network’/exp or ‘Social Platform’/exp or ‘WhatsApp’/exp or ‘Facebook’/exp or ‘Instagram’/exp or ‘Twitter’/exp or ‘Telegram’/exp or ‘YouTube’/exp or ‘Smartphone’/exp)	1,005
Google Scholar	(“Emergency Medicine” or “Emergency Care” or “Emergency Department” or “Emergency Unit”) and (“Social Media” or “Social Network” or “Social Platform” or “WhatsApp” or “Facebook” or “Instagram” or “Twitter” or “Telegram” or “YouTube” or “Smartphone”)	752

**Appendix 3.1:** Survey evaluating social media use in facility-based emergency care in Africa (English)

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**PAGE 1: STUDY INFORMATION AND CONSENT**

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<p><b>EVALUATION OF THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA</b></p> <p><b>Social Media Use Survey</b></p>
--

You are being invited to participate in a survey on the use of social media in facility-based emergency care in African. You have been invited to participate based on identification through the African Federation for Emergency Medicine (AFEM) membership database; this database noted that you are a clinician with experience providing facility-based emergency care in Africa.

Please take time to read the information presented here, which will explain the details of this project. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Should you wish to have a copy of this information for your own records, it can be shared upon request made by email to lead investigator, Dr Abdelmonim Ali Abdelrahman, at [erdoc999@gmail.com](mailto:erdoc999@gmail.com).

Your participation is entirely voluntary, and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason.

The survey should take approximately 15-20 minutes to complete. You will receive no direct benefits from participating in this research study. However, your responses may help us learn more about the use of social media in facility-based emergency care in low- and middle-income countries.

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

Your survey answers will be sent to a link at SurveyMonkey.com where data will be stored in a password-protected electronic format. No identifying information, such as your name,

email address, or IP address, will be collected, and your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study.

At the end of the survey you will be asked if you are interested in participating in an additional interview (by phone, in person, or email). If you choose to provide contact information such as your phone number or email address, your survey responses may no longer be anonymous to the researcher. However, no names or identifying information would be included in any publications or presentations based on these data, and your responses to this survey will remain confidential.

This study has been approved by the University of Cape Town Human Research Ethics Committee (REF no: 695/2020). If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honoured during the course of this project, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator, you may contact the UCT Human Research Ethics Committee on (tel) +27 21 406 6338 or (fax) +27 21 406 6411.

## **CONSENT**

**Please select your choice for consent below. You may print a copy of this consent form for your records. Selecting the “I consent to participation” on the “Agree” button indicates that you have: a) read the above information, b) are 18 years of age or older, and c) voluntarily agree to participate in this research study.**

- ☐ I consent to participation in the research study entitled, “Evaluation of the Use of Social Media in Facility-Based Emergency Care in Low-Resource Settings.”  
[continue to page 2]
- ☐ I do not consent to participation in the research study entitled, “Evaluation of the Use of Social Media in Facility-Based Emergency Care in Low-Resource Settings.”  
[continue to page 7, no participation in remainder of survey]

---

## **PAGE 2: ACTIVE CLINICAL WORK CHECK**

---

**1. I have been involved in active clinical duties as a physician in an African emergency care setting, on a regular basis for at least three months of the last year.**

- ☐ Yes [continue to page 3]
- ☐ No [continue to page 7, no participation in remainder of survey]

---

## **PAGE 3: PERSONAL INFORMATION AND DEMOGRAPHICS**

---

**1. Age:**

(years)

**2. Gender (select one):**

- ☐ Female
- ☐ Male
- ☐ Do not wish to disclose

**3. Country of emergency care work (list all):**

**4. Educational level completed (select all that apply):**

- ☐ Primary medical degree (e.g. MBChB, MD)
- ☐ Master's degree
- ☐ Completed specialist training
- ☐ Doctorate degree (e.g. PhD)

**5. Current position/rank held (select one):**

- ☐ Intern
- ☐ Resident/registrar/specialist trainee
- ☐ Non-training junior doctor (i.e., junior doctor not in a registrar position)
- ☐ Specialist
- ☐ Consultant

**6. Number of years' experience in the medical field since qualifying for primary medical degree (e.g. MBChB, MD):**

(years)

**7. What type of mobile phone do you have access to? (select one)?**

- ☐ I have access to a smart phone [continue to page 4]
- ☐ I have access to a mobile phone that can only send text messages [continue to page 4]
- ☐ I do not have access to a mobile phone [continue to page 6, no participation in remainder of survey]

---

**PAGE 4: SOCIAL MEDIA USE**

---

**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

**3. Please indicate which of the following social media applications are currently installed on your smart phone.**

- ☐ WhatsApp
- ☐ Telegram
- ☐ Facebook Messenger
- ☐ Twitter
- ☐ Other social media applications. Please list all:

--

**1. Rank social media applications installed on your smart phone in terms of frequency of use for PERSONAL/SOCIAL purposes.**

1.	
2.	
3.	
4.	
5.	

**5. Rank social media applications installed on your smart phone in terms of frequency of use for WORK-RELATED purposes (clinical care, soliciting advice, etc.)**

1.	
2.	
1.	
2.	
3.	

**6. How often do you use social media platforms to REQUEST real-time advice FROM other clinicians?**

- ☐ Daily, frequent use (5 or more times each day)
- ☐ Daily, infrequent use (4 times or fewer each day)
- ☐ Weekly (4 days or more per week)
- ☐ Weekly (3 days or less per week)
- ☐ Monthly
- ☐ Rarely (less than monthly)
- ☐ Very rarely (less than yearly)
- ☐ Never

**7. How often do you use social media platforms to PROVIDE real-time advice TO other clinicians?**

- ☐ Daily, frequent use (5 or more times each day)
- ☐ Daily, infrequent use (4 times or fewer each day)
- ☐ Weekly (4 days or more per week)
- ☐ Weekly (3 days or less per week)

- ☐ Monthly
- ☐ Rarely (less than monthly)
- ☐ Very rarely (less than yearly)
- ☐ Never

**8. How often do you use social media platforms to look up information related to a clinical situation/ presentation?**

- ☐ Daily, frequent use (5 or more times each day)
- ☐ Daily, infrequent use (4 times or fewer each day)
- ☐ Weekly (4 days or more per week)
- ☐ Weekly (3 days or less per week)
- ☐ Monthly
- ☐ Rarely (less than monthly)
- ☐ Very rarely (less than yearly)
- ☐ Never

---

**PAGE 5: ATTITUDES TOWARD THE USE OF SOCIAL MEDIA PLATFORMS IN THE CLINICAL SPACE**

---

Please indicate how much you agree to each of the following statements. If you are not able to answer a question, please select “Not applicable”.

**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

LEVEL OF AGREEMENT	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
1. Social media platforms are <b>USEFUL</b> during clinical situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Social media platforms can facilitate <b>APPROPRIATE</b> clinical information during clinical encounters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Social media platforms can facilitate <b>QUALITY</b> clinical information during clinical encounters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Social media platforms use in clinical situations carries <b>RISK TO THE CLINICIAN</b> , such as medico-legal risk in case of unintended information loss, or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



incorrect management resulting in harm, etc.		
5. Social media platforms use in clinical situations carries <b>RISK TO THE PATIENT</b> , such as unintended information loss, incorrect management resulting in harm, etc.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>

## PAGE 6: SOCIAL MEDIA PLATFORMS AND THE CLINICIAN

Please indicate how much you agree to each of the following statements. If you are not able to answer a question, please select “Not applicable”.

**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

LEVEL OF AGREEMENT	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
1. There is a strong physician community that I can access through social media platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Social media platforms' use in clinical situations allow for safer clinical care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Social media platforms' use in clinical situations allow for improved quality of care (performance, communication, accessibility, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Social media platforms' use in clinical situations allow for improved efficiency (getting required information faster, speeding up care, matching the right care at the right time for the right clinical effect).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Social media platforms' use in clinical situations reduce the cost of care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Using social media platforms improves my job performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Using social media platforms increases my job productivity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Using social media platforms enables me to care for patients more effectively (achieving more productive consultations within a shorter time).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I actively seek new ways to use social media platforms in my clinical practice, by exploring new technologies and including more applications on my smart phone.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I am concerned that using social media platforms in my clinical practice will consume too much time and that this will affect my clinical productivity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## PAGE 7: SOCIAL MEDIA PLATFORMS AND THE PATIENT

Please indicate how much you agree to each of the following statements. If you are not able to answer a question, please indicate “Not applicable”.

**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

LEVEL OF AGREEMENT	Never	Sometimes	Always	Not applicable
1. I always obtain <b>WRITTEN</b> consent from the patient or legal proxy before using clinical information in social media platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I always obtain <b>VERBAL</b> consent from the patient or legal proxy before using clinical information in social media platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I always delete all clinical information from my smart phone after each clinical encounter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. I have received objections from patients or legal proxy from using their clinical information to solicit advice using social media platforms.

Yes/No

5. I have received complaints from patients or legal proxy from using their clinical information to solicit advice using social media platforms.

Yes / No

---

**PAGE 8: CONCLUDING QUESTION**

---

**1. Would you be willing to participate in a follow-up interview regarding your use of social media in clinical emergency care?**

☐ Yes

☐ No

**2. If yes, please provide an email address at which you can be contacted. This email address will only be used for the purposes of follow-up and will not be shared outside of the study team.**

---

**PAGE 9: SURVEY COMPLETION**

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This marks the end of the survey. Thank you for your time and participation. Your responses will help our team in improving understandings of how social media is used in facility-based emergency care in Africa.

## **Appendix 3.2:** Survey evaluating social media use in facility-based emergency care in Africa (French)

Annexe A: Enquête d'évaluation de l'usage des réseaux sociaux dans les services d'urgence en milieu hospitalier en Afrique

PAGE 1: INFORMATION CONCERNANT LA RECHERCHE ET LE CONSENTEMENT  
EVALUATION DE L'USAGE DES RESEAUX SOCIAUX COMME OUTIL DE AU POINT  
D'INTERVENTION D'URGENCE EN MILIEU HOSPITALIER EN AFRIQUE

Enquête d'usage des réseaux sociaux

Vous êtes priés de prendre part à une enquête sur l'usage des réseaux sociaux au service d'urgence en milieu hospitalier en Afrique en Afrique. Vous avez été identifiés à travers la base des données de la Fédération Africaine de Médecine d'Urgence (FAMU). Votre profil dans la base des données montre que vous êtes un clinicien ayant de l'expérience dans la médecine d'urgence en milieu hospitalier en Afrique.

Veuillez lire les information ci-basses qui expliquent les détails de ce projet. Il est important de vous imprégnez la raison de cette recherché and votre niveau de participation. Il est possible d'obtenir des informations sur le protocole si vous le souhaitez. Adressez vos demandes a l'investigateur principal Dr Abdelmonim Ali Abdelrahman à [erdoc999@gmail.com](mailto:erdoc999@gmail.com).

La participation à cette enquête est libre et vous pouvez décliner. Un refus de participation ne vous affectera aucunement. Vous pouvez refuser de participer ou vous retirer à n'importe quel moment sans sanctions. Vous pouvez décliner de répondre a certaines questions.

Répondre à cette enquête prendra approximativement 15-20 minutes. Aucun bénéfice direct n'est envisageable pour la participation. Mais l'analyse des réponses renseignera sur l'usage des réseaux sociaux pour les urgences en milieu hospitalier dans les pays à faibles ou revenus moyennes.

Aucun risque en dehors du commun lié à cette enquête n est envisable.

Vos réponses seront envoyées et gardées sur un fichier électronique sur SurveyMonkey.com protégées par un mot de passe pour accès. Vos identités tel que le nom, adresse courriel électronique ou adresse IP ne seront collectées et vos réponses seront anonymes. Personne ne pourra vous identifier, identifier vos réponses ou déduire votre participation.

A la fin de l'enquête, l'on demande si vous voulez participer à une interview supplémentaire (par téléphone, en personne ou par courrier électronique). Si vous

soumettez vos identités sous forme de numéro de téléphone ou adresse courriel électronique, vos réponses ne seront pas anonymes pour l'investigateur principal. Néanmoins, aucun nom ou autres identités ne seront inclus dans les articles pour publication ou autres présentations. Vos réponses seront toujours confidentielles.

L'enquête est approuvée par le comité de recherche et éthique de l'Université de Capetown. Si vous êtes traité différemment ou vos droits ne sont pas respectés pendant cette enquête ou vous avez des questions, considérations ou plaintes adresser à une personne autre que l'investigateur principal, contactez le comité de recherche et éthique de l'Université de Capetown au 00 27 21 406 6338 (Tel) ou 00 27 21 406 6411 (fax).

## CONSENTEMENT

Prière de sélectionner un parmi les modèles de consentement ci-bas. Vous pouvez imprimer et garder une copie. Sélectionnez la phrase "Je consens à la participation" sur le bouton "Accepte" confirme que vous: a) avez lu l'information ci-haut, b) avez 18 ans d'âge ou plus, et c) acceptez volontairement de participer à cette enquête.

- Je consens de participer à la recherche intitulée: "Evaluation de l'usage des réseaux sociaux dans les services d'urgence en milieu hospitalier dans les pays à faibles ressources". [Allez à la page 2]
- Je ne consens pas de participer à la recherche intitulée: "Evaluation de l'usage des réseaux sociaux dans les services d'urgence en milieu hospitalier dans les pays à faibles ressources"

## PAGE 2: IMPLICATION ACTIVE DANS LE TRAVAIL CLINIQUE

I. Je travaille activement dans un service d'urgence en Afrique, au moins une fois par semaine pendant le dernier mois

- Oui [Allez à la page 3]
- Non [Allez à la page 7, pas d'implication dans le reste de l'enquête]

## PAGE 3: IDENTIFICATION PERSONNELLE ET DEMOGRAPHIE

1. Age

.....années

2. Genre (sélectionnez un)

- Femelle
- Male
- Ne veux pas divulguer

3. Lieu (pays) de travail au service d'urgence

4. Niveau d'étude (sélectionnez les options possibles)

- Licence
- Master
- Spécialiste
- Doctorat

5. Position actuelle/travail actuel (sélectionnez un)

- Interne
- Assistant en spécialisation
- Spécialiste
- Consultant

6. Nombre d'années d'expérience en médecine après la licence:

7. Quel type de téléphone vous utilisez? (sélectionnez un)

- J'ai un smartphone [Allez a la page 4]
- J'ai un téléphone mobile ne pouvant envoyer que les texto (SMS) [Allez a la page 4]
- Je n'ai pas d'accès a un téléphone mobile [Allez a la page 6, pas de participation au reste de l'enquête]

#### PAGE 4: USAGE DES REASEAUX SOCIAUX

A noter: Pour le besoin de cette recherche, les RS sont définies comme "outils trouves sur internet pour aider des individus ou des communautés a réunir des informations et les communiquer, à distribuer des idées, des messages, des images et autres supports dans une collaboration en temps réel" (Charalambous, 2019). Les RS fonctionnant a travers les applications mobiles ou les sites web sont inclus dans cette définition.

1. A quelle fréquence faites-vous usage des RS pour recueillir des conseils d'autres cliniciens?

- Quotidiennement
- hebdomadairement
- mensuellement
- annuellement
- Jamais

2. A quelle fréquence faites-vous usage des RS pour donner conseils a d'autres cliniciens?

- Quotidiennement
- Hebdomadairement
- Mensuellement
- Annuellement
- Jamais

3. SVP, indiquez lesquelles des applications des RS sont sur votre smartphone

- WhatsApp
- Telegram
- Facebook Messenger
- Twitter
- Autres, svp nommez-les tous:

4. Rangez les applications RS sur votre smartphone en fonction de la fréquence d'usage pour besoin personnel/social.

- 1-
- 2-
- 3-
- 4-

5-

5. Rangez les applications RS sur votre smartphone en fonction de la fréquence d'usage pour besoin de travail ((soins, conseils...))

1-

2-

3-

4-

5-

6.

7.

8. Combien de fois utilisez-vous les RS pour vérifier une information en rapport avec un cas Clinique?

- Quotidiennement, usage fréquent (plus de 5 fois)
- Quotidiennement, usage moins fréquent (moins de 5 fois)
- Hebdomadairement (4 jours ou plus par semaine)
- Hebdomadairement (3 jours ou moins par semaine)
- Mensuellement
- Rarement (moins que mensuellement)
- Très rarement (moins que annuellement)
- Jamais

#### PAGE 4: ATTITUDE ENVERS L'USAGE DES RS EN MILIEU CLINIQUE

Veuillez indiquer votre approbation des déclarations suivantes. En cas d'incapacité à répondre, choisissez la mention "pas applicable".

A noter: Pour le besoin de cette recherche, les RS sont définis comme "outils trouvés sur internet pour aider des individus ou des communautés à réunir des informations et les communiquer, à distribuer des idées, des messages, des images et autres supports dans une collaboration en temps réel" (Charalambous, 2019). Les RS fonctionnant à travers les applications mobiles ou les sites web sont inclus dans cette définition.

Niveau approbation	Fortement Désapprouvé	Désapprouvé	Ni d'accord Ni en désaccord	Approuvé	Fortement approuvé	Pas applicable
1. Les RS sont en général utiles dans le milieu clinique						
2. Les RS peuvent donner des informations cliniques appropriées en milieu clinique						

3. Les RS peuvent faciliter l'accès à l'information de qualité en milieu clinique		
4. L'usage des RS en milieu Clinique porte un risque pour le clinicien, par exemple un risque médico-légal suite à perte maladroite des informations ou une prise en charge incorrecte résultant sur un préjudice		
5. L'usage des RS en milieu Clinique porte un risque pour le malade, par exemple une perte maladroite des informations ou une prise en charge incorrecte résultant sur un préjudice		

## PAGE 5: LES RS ET LE CLINICIEN

Veuillez indiquer votre approbation des déclarations suivantes. En cas d'incapacité à répondre, choisissez la mention "pas applicable".

A noter: Pour le besoin de cette recherche, les RS sont définis comme "outils trouvés sur internet pour aider des individus ou des communautés à réunir des informations et les communiquer, à distribuer des idées, des messages, des images et autres supports dans une collaboration en temps réel" (Charalambous, 2019). Les RS fonctionnant à travers les applications mobiles ou les sites web sont inclus dans cette définition.

Degré d'approbation	Fortement Fortement Désapprouvé approuve	Désapprouvé Ni d'accord Ni en désaccord	Approuve	Pas applicable
1. Il y a une communauté importante de médecins que je peux accéder sur les RS				
2. L'usage des RS en milieu Clinique permet une prise en				



charge Clinique sans danger		
3. L'usage des RS en milieu Clinique permet la prise en charge de qualité (performance, communication, accessibilité, etc...)		
4. L'usage des RS en milieu Clinique améliore l'efficience (avoir les informations nécessaires rapidement, traiter rapidement, aligner traitement correct a temps pour l'effet Clinique escompte)		
5. L'usage des RS en milieu Clinique diminue le cout		
6. L'usage des RS améliore ma performance clinique		
7. L'usage des RS augmente ma productivité		
8. L'usage des RS permet une prise en charge effective des patients (réaliser des consultatives fructueuses en peu de temps		
9. Je continue à chercher constamment d'autres usages utiles des RS en milieu		

Clinique. Je le fais en cherchant des nouvelles technologies et des nouvelles applications sur mon smartphone		
10. Je pense que l'usage des RS peut nécessiter beaucoup de temps et ainsi diminuer ma productivité		

#### PAGE 6: LES RS ET LES MALADES

Veillez indiquer votre approbation des déclarations suivantes. En cas d'incapacité à répondre, choisissez la mention "pas applicable".

A noter: Pour le besoin de cette recherche, les RS sont définis comme "outils trouvés sur internet pour aider des individus ou des communautés à réunir des informations et les communiquer, à distribuer des idées, des messages, des images et autres supports dans une collaboration en temps réel" (Charalambous, 2019). Les RS fonctionnant à travers les applications mobiles ou les sites web sont inclus dans cette définition.

Niveau approbation	Fortement Fortement Désapprouvé approuve	Désapprouvé Ni d'accord Approuve Ni en désaccord	Pas applicable
J'obtiens toujours un consentement écrit du malade (ou de ses proches si le malade est dans une incapacité) avant d'utiliser les informations cliniques sur les RS			
J'obtiens toujours un consentement verbal du malade (ou de ses proches si le malade est dans une incapacité) avant d'utiliser les informations cliniques sur les RS			
J'efface toujours les informations cliniques de mon smartphone après usage			
J'ai déjà des objections du malade (ou de ses proches) en rapport avec l'usage de ses informations cliniques sur les RS afin d'obtenir un conseil			
J'ai déjà eu des plaintes du malade (ou de ses proches) en rapport avec l'usage de ses informations cliniques sur les RS afin d'obtenir un conseil			

#### PAGE 8: QUESTION FINALE

Seriez-vous prêt à participer à l'interview à suivre concernant l'usage des RS dans la pratique de la médecine d'urgence?

- Yes
- No

PAGE 8: FIN DE L'ENQUETE

C'est la fin de l'enquête. Merci pour votre temps et participation. Vos réponses aideront à comprendre comment les RS sont utilisés dans les urgences en milieu hospitalier en Afrique.

### Appendix 3.3: Survey evaluating social media use in facility-based emergency care in Africa (Arabic)

تقييم استخدام وسائل التواصل الاجتماعي في  
رعاية الطوارئ القائمة على المرافق في جنوب أفريقيا  
AA024 مسح

ننصحك بقراءة ما يلي على جهازك أو هاتفك المحمول أفقيًا.  
البيانات والمعلومات التي سيتم جمعها من هذه الدراسة سرية ولن تستخدم إلا للأغراض العلمية والبحثية.  
لن يتم الكشف عن هويتك (هوية المستفتي) بأي شكل من الأشكال.  
مشاركتك في هذا الاستبيان لا تعني أنك سوف تجرب دواء ، بل حالة افتراضية.  
يتعلق هذا الاستبيان بمعرفتك وأرائك حول فعالية واستخدام تطبيقات الاتصال مثل Whatsapp في التواصل بين مقدم الرعاية والمرضى وكذلك أسسهم للتحقيق وإدارة حالاتهم عن بعد.  
ستساعدنا إجاباتك على معرفة كيفية تشجيع أو تثبيط المشاركة في هذه العصور والأساليب لرفع كفاءة الاستجابة والإدارة في مجال طب الطوارئ. سيستغرق الأمر حوالي 10 دقائق للمشاركة في الاستبيان.  
يرجى قراءة التعريفات التالية قبل البدء في استكمال الاستبيان:  
ما هو واتس اب؟ WhatsApp مجاني لتنزيل تطبيق messenger للهواتف الذكية. يستخدم WhatsApp الإنترنت لإرسال الرسائل أو الصور أو الصوت أو الفيديو. الخدمة تشبه إلى حد كبير خدمات الرسائل النصية ، ولكن نظرًا لأن WhatsApp يستخدم الإنترنت لإرسال الرسائل ، فإن تكلفة استخدام WhatsApp أقل بكثير من الرسائل النصية.  
ما هو التواصل؟ يشير الاتصال إلى شكل من أشكال الاتصال الذي يستخدم الكلمات المنطوقة والمكتوبة للتعبير عن الآراء والأفكار ونقلها.

ما هو دور واتس اب في الاتصالات الطبية؟  
يتم الإبلاغ عن العديد من الفوائد المتصورة ؛ في الواقع ، تشير البيانات إلى أن استخدام WhatsApp: تحسين التواصل بين المهنيين والعلاقة بين الطبيب والمريض ؛ يزيد الكفاءة؛ يمكن أن تقلل من التكاليف في المستشفى ؛ هو توفير الوقت تحسين تبادل المعرفة السريرية والعلمية  
ستتم الدراسة على التركيز على الدول الأفريقية بشكل رئيسي وسيتم تفصيل المسح من المملكة العربية السعودية. وقمت بالاختيار بشكل عشوائي على أساس كونك جزءًا من نظام تقديم الرعاية الصحية. بدأت الدراسة في عام 2019 وربما تنتهي في عام 2020. أنا من ساقود الدراسة. دكتور عبد المنعم عبدالرحمن.

#### مسح الدراسة

المعلومات الشخصية والتركيب السكانية

- العمر: ..... سنوات
- الجنس (اختر واحدة):

❖ أنثى

❖ ذكر

❖ لا ترغب في الكشف

- آخر مستوى تعليمي مكتمل (حدد كل ما ينطبق):

○ بكالوريوس

○ ماجستير

○ إتمام تدريب متخصص.

○ دكتوراه

- 4. المركز / الرتبة (اختر واحدًا):

○ س متدرب

- المقيم / المسجل / المتدرب المتخصص
- متخصص
- مستشار
- سنوات الخبرة الفعلية في المجال الطبي منذ التأهل من درجة البكالوريوس ..... سنوات
- هل لديك وصول إلى هاتف ذكي؟ أو هاتف محمول يمكنه إرسال رسائل نصية فقط (اختر واحدة)؟
- نعم ، لدي هاتف ذكي
- نعم ، لدي هاتف محمول يمكنه إرسال رسائل نصية فقط
- لا [إذا لم يكن الأمر كذلك ، فيمكن أن يتوقف الاستطلاع هنا]
- كم مرة تستخدم الرسائل النصية / متعددة الوسائط لطلب المشورة من الأطباء الآخرين؟
- اليومي
- أسبوعي
- شهري
- سنوي
- أبدا
- كم مرة تستخدم الرسائل النصية / متعددة الوسائط لتقديم المشورة لأطباء آخرين؟
- اليومي
- أسبوعي
- شهري
- سنوي
- أبدا
- حدد تطبيقات رسائل الوسائط الاجتماعية المثبتة حاليًا على هاتفك الذكي.
- WhatsApp
- برقية
- Facebook Messenger
- تويتر
- تطبيقات رسائل الوسائط الاجتماعية الأخرى. يرجى إدراج .....
- ترتيب التطبيقات من حيث تكرار الاستخدام للأغراض الشخصية / الاجتماعية
- (1) .....
- (2) .....
- (3) .....
- (4) .....
- ترتيب التطبيقات من حيث تكرار الاستخدام للأغراض المتعلقة بالعمل (الرعاية السريرية ، التماس المشورة ، إلخ).
- (1) .....
- (2) .....
- (3) .....
- (4) .....

عدد مرات باليوم	يوميًا	3 مرات بالاسبوع	اسبوعيا	شهريا	نادرا	ابدا	١. كم مرة تستخدم تطبيقات مراسلة وسائل التواصل الاجتماعي لطلب / تقديم المشورة للرعاية السريرية

1. كم مرة تستخدم تطبيقات المراسلة عبر وسائل التواصل الاجتماعي لطلب المشورة من الأطباء الآخرين؟							
2. كم مرة تستخدم تطبيقات رسائل الوسائط الاجتماعية لتقديم المشورة للأطباء الآخرين							
3. كم مرة تستخدم وسائل التواصل الاجتماعي للبحث عن معلومات تتعلق بحالة سريرية / عرض تقديمي؟							

موافق بشده	موافق	موافق الي حد ما	غير محدد	غير موافق الي حد ما	غير موافق بشده	II. الموقف من استخدام تطبيقات رسائل الوسائط الاجتماعية
						وضّح ما تشعر به حيال العبارات التالية.
						4. تطبيقات المراسلة على وسائل التواصل الاجتماعي مفيدة بشكل عام أثناء المواقف السريرية
						5. استخدام تطبيقات المراسلة على وسائل التواصل الاجتماعي في المواقف السريرية يحمل بعض المخاطر على الطبيب مثل ميديكو-ليجال
						6. استخدام تطبيقات مراسلة وسائل التواصل الاجتماعي في المواقف السريرية يحمل بعض المخاطر على المريض مثل المعلومات والخطأ والتسبب في ضرر
						7. يمكن لتطبيقات المراسلة عبر وسائل التواصل الاجتماعي تسهيل المعلومات السريرية المناسبة أثناء المواجهة السريرية

موافق بشده	موافق	موافق الي حد ما	غير محدد	غير موافق الي حد ما	غير موافق	غير موافق بشده	III. فعالية تطبيقات رسائل الوسائط الاجتماعية
							8. يوجد مجتمع أطباء قوي يمكنني الوصول إليه من خلال تطبيقات المراسلة على وسائل التواصل الاجتماعي.
							9. استخدام تطبيقات المراسلة عبر وسائل التواصل الاجتماعي في المواقف السريرية يسمح برعاية أكثر أماناً
							10. استخدام تطبيقات رسائل الوسائط الاجتماعية في المواقف السريرية يسمح بتحسين جودة الرعاية مثل الأداء والتواصل وإمكانية الوصول
							11. استخدام تطبيقات المراسلة عبر وسائل التواصل الاجتماعي في المواقف السريرية يسمح بتحسين الكفاءة في الحصول على المعلومات المطلوبة ، أو تسريع الرعاية ، أو الحصول على الرعاية المناسبة في الوقت المناسب لإحداث تأثير طبي
							12. استخدام تطبيقات المراسلة عبر وسائل التواصل الاجتماعي في المواقف السريرية قلل من تكلفة الرعاية ، مقارنة بالأساليب العادية.
							13. يؤدي استخدام تطبيقات المراسلة عبر وسائل التواصل الاجتماعي إلى تحسين أداء وظيفتي.
							14. يزيد استخدام تطبيقات المراسلة عبر وسائل التواصل الاجتماعي من إنتاجية وظيفتي.
							15. يمكّني استخدام تطبيقات الرسائل الاجتماعية من رعاية المرضى بشكل أكثر فعالية. من خلال تحقيق المزيد من الاستشارات في وقت قصير
							16. أبحث بنشاط عن طرق جديدة لاستخدام تطبيقات رسائل الوسائط الاجتماعية في ممارستي. من خلال استكشاف تقنيات جديدة وإنشاء المزيد من التطبيقات
							17. أشعر بالقلق من أن استخدام الرسائل عبر وسائل التواصل الاجتماعي



سيستهلك الكثير من الوقت الشخصي بمجرد أن أبدأ. وسيؤثر هذا على إنتاجيتي السريرية						
<b>IV. جانب المريض</b>						
18. أ حذف دائمًا أي معلومات خاصة بالمريض من جهازي بعد وصولي إلى التشخيص وإنهاء الإدارة						
19. أ طلب دائمًا الموافقة الشفوية من المريض أو الأسرة قبل استخدام المعلومات السريرية لطلب المشورة باستخدام تطبيقات المراسلة على وسائل التواصل الاجتماعي						
20. لا توجد شكاوى من المرضى لاستخدام معلوماتهم السريرية والشخصية لطلب المشورة على وسائل التواصل الاجتماعي						

**Appendix 3.4:** Ethical approval for “*Describing the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa.*”

*University of Cape Town Human Research Ethics Committee Approval*



**UNIVERSITY OF CAPE TOWN**  
**Faculty of Health Sciences**  
**Human Research Ethics Committee**



Room G50- Old Main Building  
Groota Schuur Hospital  
Observatory 7925  
Telephone [021] 406 6492  
Email: [hrec-enquiries@uct.ac.za](mailto:hrec-enquiries@uct.ac.za)  
Website: [www.health.uct.ac.za/fhs/research/humanethics/forms](http://www.health.uct.ac.za/fhs/research/humanethics/forms)

20 November 2020

**HREC REF: 695/2020**

**Prof L Wallis**  
Division of Emergency Medicine  
F-51, OMB  
Email: [lee.wallis@uct.ac.za](mailto:lee.wallis@uct.ac.za)  
Student: [erdoc999@gmail.com](mailto:erdoc999@gmail.com)

Dear Prof Wallis

**PROJECT TITLE: DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE  
TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA. (SUB-STUDY  
LINKED TO: 464/2017) (PHD CANDIDATE: DR ABDELMONIM ABDELRAHMAN)**

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

**This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, dated 17 March 2020 & 06 July 2020.**

**Approval is granted for one year until the 30 November 2021.**

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: [www.health.uct.ac.za/fhs/research/humanethics/forms](http://www.health.uct.ac.za/fhs/research/humanethics/forms))

**The HREC acknowledge that the student: Dr Abdelmonim Abdelrahman will also be involved in this study.**

**Please quote the HREC REF in all your correspondence.**

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate Institutional approval, where necessary, before the research may occur.

HREC/REF-695/2020sa

### **Appendix 3.5: University of Cape Town study proposal (FHS015)**

#### **DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA**

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#### **DECLARATION**

I, Abdelmonim Abdelrahman, hereby declare that the work on which this proposal is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

I empower the university to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

**Signature:**



**Date:** 10 September 2020



## **ABSTRACT**

### **Introduction:**

The potential of social media to improve health communication and health information sharing between clinicians in emergency care in low-resource settings (LRS) cannot be underestimated. Social media, including mobile applications and online websites, is already informally used in LRS to provide real-time clinical support to emergency care providers, who might otherwise lack adequate training or access to information. It is unlikely that this practice can be halted, despite arguably valid concerns based largely on legality, and existing evidence suggests that the benefits to its use outweigh associated risks. It is likely that contextually appropriate guidance on the application of social media to healthcare would yield safer use; this would be especially impactful in LRS, where there is strong, anecdotal evidence of uncontrolled use of social media as a point-of-care tool in emergency care.

In order to do this, its scope of use must be better understood, but no study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa. There is a need for in-depth investigation into the currently undocumented use of social media for point-of-care throughout Africa. Such a study will provide insight into how clinicians are obtaining clinical insight from other providers and allow for the development of guidance on safe and effective social media for use in healthcare knowledge sharing and seeking.

This PhD aims to fully describe the use of social media as a point-of-care tool in facility-based emergency care in Africa.

### **Methods:**

A scoping review was conducted to map the available literature on the use, results, benefits and risks associated with social networking as a point-of-care platform as part of a scoping review. For study two, a self-reported, cross-sectional survey describing the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care tool will be administered to African emergency care practitioners. Finally, in study three, semi-structured interviews will be conducted to gain an understanding of African clinicians' views, attitudes and behaviours towards social media use to enhance bedside emergency care. Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

**We are currently applying for ethical approval for study two of the PhD.**

### **Ethical considerations:**

No part of the study will use, or encourage the use of, social media in clinical or other professional settings; all parts of this research will provide simple descriptions of current practices surrounding the use of social media. As described in the motivation, this practice is already fairly pervasive within the clinical setting. This research provides the opportunity

to describe the extent of social media use to enhance clinical care at a critical junction of the patient journey. In the survey and interviews, practitioners will be asked to answer questions on their use of social media in healthcare settings, whether or not this use is sanctioned by the system in which they practice. Information gained from this study will improve our understanding of perceived risks and benefits; matched against existing, described risks and benefits, this would allow a more considered response to managing the practice. Legal implications related to privacy and clinical risk should not be of concern in an observational design such as this.

Survey participants will provide informed consent prior to participation in this study. All survey data will be maintained in de-identified form on an access-controlled desktop computer, with access only allowed by the study team. Transfer of data between the study team will only occur through encrypted, institutional email and no hard copies of data will be generated at any point of the study.

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## INTRODUCTION

### 1.1 Background

Growing evidence suggests an important role for emergency care in accelerating progress on global health priorities and narrowing health disparities (1-5). The World Bank's Disease Control Priorities project estimates that of the 45 million deaths per year in low- and middle-income countries (LMICs), 54% are due to conditions that are potentially addressable through prehospital and/or emergency unit (EU) care (1). This translates to a staggering 932 million years of life lost to premature mortality and over a million disability-adjusted life years (1). Despite this, emergency care has remained virtually absent from the global health agenda, as most initiatives – particularly in low-resource settings (LRS) - have emphasised prevention, primary care, and vertical approaches to disease control.

This lack of prioritisation manifests in many ways within emergency care, not the least of which is a significant shortage of adequately trained facility-based staff to populate EUs (6, 7). The majority of African countries have not recognised emergency medicine as a medical specialty in its own right, and the few that have only did so in the last decade (6). Regardless, EUs in most of the continent are largely staffed by rotating or junior clinical personnel, who are often poorly equipped to handle the wide variety of acute presentations with the limited resources available to them (8). Educational and training opportunities are not accessible or inadequate and this is further compounded by extremely limited access to best practice information or guidance appropriate for clinicians in LRS.

The internet is a powerful tool for education and for information sharing, and internet penetration rates and connection speed throughout Africa have seen dramatic increases recent decades. The continent's internet penetration rate, which was 42.2% in June 2020, has seen a 12,441% increase between 2000 and 2020 (9). Despite these improvements, compared to the rest of the world, internet usage rates are well below average: The global average penetration rate is approximately 62.0%, with high-income countries (HICs) reaching well above 90% (9, 10). Many African countries – particularly the lowest-income and those in conflict areas – have very low overall internet access and poor internet infrastructure (9, 10). Interestingly, those African countries that are experiencing growth in broadband and mobile technology in particular appear to roughly correlate with the list of countries with active growth of emergency care systems and functionality. Botswana, Egypt, Ethiopia, Ghana, Mozambique, Rwanda, South Africa, Sudan, Ethiopia, Tanzania, Uganda, and Zimbabwe are currently the only countries out of 52 with established emergency medicine training programmes, though some of these are for training specialist physicians and others only have non-specialist offerings (11). South Africa has both the most developed emergency care systems on the continent, and one of the highest broadband and mobile internet usage rates (9, 10, 12).



With growth in internet use in general comes marked growth in the popularity of social media sites and applications, both worldwide and in Africa. The number of Facebook users in Africa was estimated at approximately 213 million individuals in 2020, up 64.5% since 2015 (13). Nearly the same number – 192 million – are noted to use Africa's most popular messaging app, WhatsApp (14). Many of these sites and applications are commonly used around the world by healthcare practitioners and students (15). In HICs, the use of social media by facility-based clinicians to inform healthcare decision-making has been well-documented (15) (16-18). Clinicians report using social media in a range of ways, include finding and exchanging information, directly communicating or networking with colleagues, disseminating research findings, participating in health advocacy, and marketing a product or practice (15, 18). In addition, some use social media to directly interact with patients or to gather patients' personal information when traditional sources of information are exhausted. For example, a study of paediatric faculty and trainees in the United States found that between 14% and 18% of trainees had conducted an internet or social media search for information about a patient, and 14% of faculty stated they would use the internet to determine necessary additional patient information (19). A 2009 study describing the effect of social media internet tools on junior physicians' daily clinical practice reports Google and Wikipedia use by 80% and 70% of physicians, respectively (20). A 2013 systematic review identified six key overarching benefits of social media use in a clinical setting: increased interactions with others, more available, shared and tailored information, increased accessibility and widening access to health information, peer/social/emotional support, public health surveillance, and the potential to influence health policy (21). In the context of the COVID-19 pandemic, healthcare-related social media use has skyrocketed: Providers are leveraging social media to disseminate critical information and connect with those in need of care (22).

Physicians' use of social networking as a tool to crowdsource answers to clinical questions has been of particular interest, as it has the potential to enhance real-time clinical care in settings where other sources of information are limited or unavailable. Two examples of this application in the United States healthcare system are Sermo ([www.sermo.com](http://www.sermo.com)) and Doximity ([www.doximity.com](http://www.doximity.com)) (23). Sermo is an online social networking community where "physicians across all 50 states in the US representing 68 specialties come to network, discuss treatment options, and curb side peers for expert advice whenever they need it" (23). Doximity, a newer physician-only social networking community, allows users to search a database of healthcare providers, and supports point-of-care crowdsourcing via Health Insurance Portability and Accountability Act (HIPAA)-compliant messaging within this database (23).

The potential benefits of social media in clinical practice are ample and have been described in observational studies in some settings; however, there are limitations and risks inherent to this type of information sharing and seeking that have not been studied in-depth (15, 18-21). Numerous institutional statements and practical guidelines have emerged as the social media landscape has developed, and many studies on social

media use in healthcare include best practice recommendations (15, 24-29). A 2012 review of social media use by clinicians found that two types of risk are prevalent and thus of major concern: breaches of patient confidentiality and publication of unprofessional content (30). Other issues with healthcare-related social media used include high levels of low-quality information and lack of quality oversight, licensing issues, liability, and legal grey areas stemming from the rapid emergence and evolution of social media use. Use of social media tools for physician education in emergency care is under-reported. One study of the integration of social media into emergency medicine residency curricula surveyed 226 residents across 12 different US residency programs and found that 98% used some sort of social media learning at least one hour per week (31). However, the types of modalities described are limited to blogs, podcasts, and video casts, none of which are of much particular use in real-time clinical care. Other literature on social media use in emergency care is sparse, particularly for one-on-one communication with other professionals or point-of-care information-seeking.

Social media use could have value in LRS as a tool, especially in LRS where health education infrastructure cannot provide the level of support, mentorship, and information required to maintain clinical best practices. Indeed, there is strong anecdotal evidence in the African emergency care community that suggests it is already used extensively for these purposes within African EUs. However, an educated understanding of the prevalence of use, and the benefits and risks of social media use to inform frontline clinical emergency care in real-time lacks in this setting.

Note that, for the purpose of this PhD, social media is being evaluated in the context of its utility as a real-time point of care tool. A range of platforms may serve this function, including those that support instant messaging (e.g. WhatsApp, Facebook Messenger and Telegram) as well as others that allow for the posting of text and multimedia in forums (e.g. Facebook) (32). The following definition of social media will be adhered to throughout this work: "Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time" (33, 34).

## **1.1 Motivation**

The potential of social media to improve health communication and health information sharing in emergency care in LRS cannot be underestimated. Social media, including its mobile applications, are already informally used in LRS to provide real-time clinical support to emergency care providers, who otherwise lack adequate training or access to information. It is unlikely that this practice can be halted, despite arguably valid concerns based largely on legality, and existing evidence suggests that the benefits to its use outweigh associated risks (30). It is likely that contextually appropriate guidance on the application of social media to healthcare would yield safer use; this would be especially impactful in LRS, where there is strong, anecdotal evidence of uncontrolled use of social media as a point-of-care tool in emergency care.

In order to do this, its scope of use must be better understood, but no study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa. There is a need for in-depth investigation into the currently undocumented use of social media for point-of-care throughout Africa. Such a study will provide insight into how clinicians are accessing clinical information that is not locally available but considered important for acute care, and allow for the development of guidance on safe and effective social media for use in healthcare knowledge sharing and seeking.

## **1.2 Aim and objectives**

This PhD aims to fully describe the use of social media as a point-of-care tool in facility-based emergency care in Africa.

It has the following objectives:

1. To describe, through a scoping review, the effectiveness, benefits and risks pertaining to the use of social media as a point-of-care tool for emergency care globally. **(study one – already completed)**
2. To describe, through a survey, the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care tool by emergency care providers in Africa. **(study two – subject of this application)**
3. To describe, through interviews, the perception of the risks and benefits, and barriers and facilitators, and intention-to-use of social media as a point-of-care tool for emergency care. **(study three)**

Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

**We are currently applying for ethical approval for study two of the PhD.**

## **2. METHODS**

**2.1 Study one:** Scoping review on the use of social media as a point-of-care tool for emergency care practitioners worldwide.

### **2.1.1 Aim and objectives**

Study one aimed to assess the existing literature base for information on the use of social media as a point-of-care tool for emergency care practitioners worldwide.

It had the following objectives:

1. With regard to the use of social media platforms for real-time clinical consultation by emergency care practitioners:
  - a. Identify what social media platforms are currently being used
  - b. Evaluate their potential impacts on patient outcomes.
  - c. Describe the risks and benefits associated with their use.
  - d. Identify facilitators and barriers for their use.

2. Identify gaps in the literature on the relationship between the use of social media and efficacy of clinical care in EUs.

This review was subject to ethical approval in 2017 HREC REF 464/2017. It has been completed and is being written up for publication in a peer reviewed journal.

## **2.2 Study two: Survey-based assessment of the use of social media as a point-of-care tool by facility-based emergency care practitioners in Africa.**

### **2.2.1 Aim and objectives**

Study two aims to broadly describe the use of social media as a point-of-care tool by emergency care practitioners in Africa.

It has the following objectives:

1. Describe the demographic characteristics of African emergency care practitioners that use social media as a point-of-care tool.
2. Quantify prevalence of use of various social media platforms by African emergency care practitioners.
3. Describe African emergency care practitioners' social media usage habits and practices.
4. Understand African emergency care practitioners' attitudes towards use of social media in facility-based emergency care.

### **2.2.2 Study design**

A self-reported, cross-sectional survey describing the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care tool by African emergency care practitioners.

### **2.2.3 Study population and sampling**

The target population for this study is facility-based emergency care practitioners working in Africa. The resulting sample will include both native African and international emergency care practitioners; the key inclusion criteria being active, clinical duty within an African EU. Given that this study is assessing the prevalence of use of social media in facility-based emergency care, participants need not use it on any basis to participate.

Purposive, non-probability recruitment will be conducted to enrol participants in this study. Participants will be identified via the African Federation for Emergency Medicine (AFEM) membership database. All members of the AFEM database will be contacted via institutional email using AFEM's listserv infrastructure and asked to participate. AFEM is an international non-profit representing a broad coalition of organisations, national societies, and individuals dedicated to the development of emergency care across Africa. As of 2020, AFEM had a membership base of approximately 1000 individuals across more than 20 countries, all of whom agreed upon membership application to be contacted to participate in any research being conducted in compliance with South African privacy

laws. Membership is extended to nurses, prehospital providers, clinical officers, clinicians, and specialists working either full-time or part-time in emergency care or critical within an African setting. Per AFEM, 500 of these members will meet study inclusion criteria. Approximately 200 academic staff and postgraduate students from academic institutions offering African emergency care training within Africa will also be contacted to participate using a second listserv.

There is extremely limited information describing prevalence of use of social media for communication in both LRS healthcare settings and emergency medicine. A recent study based in the United States suggested that between 60% and 80% of healthcare providers in a large healthcare system used social messaging platforms to discuss patient care in real-time (35). Based on this, we have established a conservative estimate that 60% of respondents will report use of social media as a point-of-care tool. At the level of  $\alpha = 0.05$  and 80% power, this yields a requisite sample size of 95 participants to conduct proportional comparisons. Accounting for some overlap between the two aforementioned listservs, we estimate a total of 600 eligible participants. A 2016 study using the AFEM database achieved a 34.8% response rate (36). Assuming a similar rate in our study, we can expect approximately 209 respondents, more than double the required sample size.

#### **2.2.4 Data collection and management**

An electronic survey has been created (Appendix A) and will be uploaded to and distributed on SurveyMonkey (© SurveyMonkey Inc., Palo Alto, California, USA) using an institutional subscription membership. To improve the response rate, the survey will also be made available in French. It will not be made available in Arabic because all Arabic medical training institutions instruct in English.

The survey has been pretested for readability and content by four members of the study team. Prior to the survey being released, the content will be validated using five African emergency care practitioners to review the survey and report back on understanding, readability and clarity of the questions posed. These will then be considered by the study team and changes will be made to the provisional survey to include all reasonable comments and suggestions to produce the final survey.

The survey collects demographic information and then seeks to identify early adopters or heavy users of social media platforms in clinical emergency care practice. A link to the survey will be distributed via email to the AFEM and academic cohorts. The survey will begin with information regarding the study and a request for consent, followed a question assessing a participant's current activity as a clinician in facility-based African emergency care. Should participants not choose to consent or denote that they have not been active in clinical duties in an African emergency care setting for at least three months of the past year, they will be directed to the conclusion page of the survey and asked for no further information. Participants that consent and denote active status as a clinician will be brought to the core survey, where five sections of questions will assess their demographics, and usage of and attitudes towards social media. The research assistant

will monitor survey response rates and manage weekly reminders for non-respondents over a six-week response period in early 2021.

### **2.2.5 Data analysis**

A descriptive analysis will be conducted to describe demographic features and prevalence of social media usage. Categorical data will be described as proportions for each question. Associations between different categories will be tested using the Chi-squared or Fisher's exact statistics. Where indicated, corresponding 95% confidence intervals will be provided. A p-value of 0.05 will be accepted as an indication of significance.

Analyses will be conducted using Microsoft Excel (© Microsoft Corporation, Redmond, WA, USA) and R statistical software (© The R Foundation, Vienna, Austria).

### **2.2.6 Limitations**

There are some limitations inherent to this study's methodology. First is in its sampling: The use of specified contact databases will, due to respondent clustering, introduce a selection bias in the survey. The results may misrepresent the true picture since geographic location of individuals is not evenly distributed across the continent. The survey will only reach those participants affiliated with AFEM and/or an academic institution, and thus results will not reflect those practicing outside of these groups. However, AFEM's network is expansive, with many of its members working in non-academic healthcare facilities; this reach will hopefully allow for increased heterogeneity in respondents' work settings. Surveys are also at risk of misinterpretation, with participants not interpreting specific questions as the creator intended and responding based on inaccurate understandings. This survey has been extensively pilot tested in an effort to improve readability and consistency of interpretations. Data collected from surveys may also lack the depth and detail on the specific research topic, however, this study is meant to provide a snapshot of the availability of resources across different countries (i.e. laying a foundation on which a framework and future studies can be built).

Another factor influencing results could be a poor (and unpredictable) survey response rate. As mentioned, regular reminders will be sent in an attempt to capture as many responses as possible and the current estimated number of respondents is more than double the number required for analyses. Language barriers may also cause bias. As all AFEM activities are conducted and communicated in English, it is hoped that a large proportion of the participants will understand a sufficient amount of English to be able to complete the survey. It is also suspected and hoped that those most vocal about social media will be confident English speakers, as English is the medium used for publicising and disseminating opinions and outputs across practice settings on much of the continent. A bias may be introduced, however, by exclusion of participants who may have provided good insight but have a poor grasp of spoken or written English. Therefore, the survey will also be made available in French.

### 2.2.7 Ethical considerations

Ethical approval will be obtained from UCT HREC prior to beginning this study. No part of the study will use, or encourage the use of, social media in clinical or other professional settings; all parts of this research will provide simple descriptions of current practices surrounding the use of social media. As described in the motivation, it is likely that this practice is already fairly pervasive within the clinical setting. This research provides the opportunity to describe the extent of social media use to enhance clinical care at a critical junction of the patient journey. Information gained from this study would likely improve our understanding of perceived risks and benefits; matched against existing, described risks and benefits, this would allow a more considered response to managing the practice. Legal implications related to privacy and clinical risk should not be of concern in an observational design such as this.

*Data safety:* The survey settings will be set to conduct the survey anonymously. The research team will be blinded to all identifying details of participants through the use of features that prevent the exportation of identifying information in the dataset. Data will be imported from the backend of SurveyMonkey into a password-protected Microsoft Excel file for analysis. The file will be stored on an access-controlled desktop computer. Transfer of data between the study team will only occur through encrypted, institutional email. Only the study team will have access to data. No hard copies of data will be generated at any point of the study.

*Benefits and Risks:* The findings will provide a general sense of social media use of African emergency care physicians and likely provide an idea of the prevalence of use. As very little data currently exist in LRS, this will likely provide hypotheses for further studies as well as provide information that may be used to construct guidance on its use. An anonymous sample will help, although not completely negate the risk of retrospectively identifying a participant or facility by association; however, there is no specific interest in individual delegates. In any event there will be no way to confirm a specific person contributed to the survey with the anonymous setting activated. We believe this to be the first study ever conducted in the use of social media for enhancement of direct emergency care and that the benefits outweigh these risks.

*Consent:* Participation is voluntary. The AFEM database to be used to recruit participants is already POPI-Act compliant (and has been used as such previously following applications through UCT HREC). Members of AFEM can opt out of research participation upon registration with the society or at any time afterwards. In addition, completion of the survey is voluntary. Subjects can simply elect not to complete it with no negative impacts. The heads of emergency medicine departments/ divisions of African academic institutions will be contacted prior to the survey, following ethical review at the University of Cape Town, to consent to distribution of the survey to relevant staff and students on the academic listserv. All participants will be provided with adequate information regarding the study, including contact details for the researchers and UCT HREC, and asked to consent prior to participation in the survey (Appendix A).

*Confidentiality:* The survey will make use of the e-survey client's anonymous setting. This will ensure anonymous completion of the survey with the back-end (which is not accessible to the study team) allowing reminders to be sent to non-responders. This is a standard setting provided by SurveyMonkey.

### 2.2.8 Reporting of results

The results of this study will be written in report form and provided to any interested parties (including AFEM and participating academic institutions) for review. They will also be written into a manuscript for publication. Finally, they will serve to inform the interviews conducted in study three and post-doctoral work developing a framework to guide use of social media in facility-based emergency care in the African setting.

## 3. TIMELINE

Year	2020		2021				2022			
Quarter	3	4	1	2	3	4	1	2	3	4
<b>STUDY TWO</b>										
Ethical approvals (EMDRC, HREC)	X	X								
Research preparation		X	X							
Data collection			X							
Data analysis				X						
Reporting and implementation of results					X	X				
<b>STUDY THREE</b>										
Ethical approvals (EMDRC, HREC)		X	X							
Research preparation				X	X					
Data collection					X	X				
Data analysis						X	X			



Reporting and implementation of results								X	X		
<b>DISSERTATION</b>											
Dissertation preparation							X	X	X	X	
Dissertation submission											X

#### 4. RESOURCES

There are no costs associated with study two.

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## **6. APPENDICES**

### **Appendix A: Survey evaluating social media use in facility-based emergency care in Africa**

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#### **PAGE 1: STUDY INFORMATION AND CONSENT**

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**EVALUATION OF THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TOOL IN  
FACILITY-BASED EMERGENCY CARE IN AFRICA**

**Social Media Use Survey**

You are being invited to participate in a survey on the use of social media in facility-based emergency care in African. You have been invited to participate based on identification through the African Federation for Emergency Medicine (AFEM) membership database;

this database noted that you are a clinician with experience providing facility-based emergency care in Africa.

Please take time to read the information presented here, which will explain the details of this project. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Should you wish to have a copy of this information for your own records, it can be shared upon request made by email to lead investigator, Dr Abdelmonim Ali Abdelrahman, at [erdoc999@gmail.com](mailto:erdoc999@gmail.com).

Your participation is entirely voluntary, and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason.

The survey should take approximately 15-20 minutes to complete. You will receive no direct benefits from participating in this research study. However, your responses may help us learn more about the use of social media in facility-based emergency care in low- and middle-income countries.

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

Your survey answers will be sent to a link at SurveyMonkey.com where data will be stored in a password-protected electronic format. No identifying information, such as your name, email address, or IP address, will be collected, and your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study.

At the end of the survey you will be asked if you are interested in participating in an additional interview (by phone, in person, or email). If you choose to provide contact information such as your phone number or email address, your survey responses may no longer be anonymous to the researcher. However, no names or identifying information would be included in any publications or presentations based on these data, and your responses to this survey will remain confidential.

This study has been approved by the University of Cape Town Human Research Ethics Committee (REF no: [TBC]). If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honoured during the course of this project, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator, you may contact the UCT Human Research Ethics Committee on (tel) +27 21 406 6338 or (fax) +27 21 406 6411.

## **CONSENT**

**Please select your choice for consent below. You may print a copy of this consent form for your records. Selecting the “I consent to participation” on the “Agree” button indicates that you have: a) read the above information, b) are 18 years of age or older, and c) voluntarily agree to participate in this research study.**

- ☐ I consent to participation in the research study entitled, “Evaluation of the Use of Social Media in Facility-Based Emergency Care in Low-Resource Settings.”  
[continue to page 2]
- ☐ I do not consent to participation in the research study entitled, “Evaluation of the Use of Social Media in Facility-Based Emergency Care in Low-Resource Settings.”  
[continue to page 7, no participation in remainder of survey]

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## **PAGE 2: ACTIVE CLINICAL WORK CHECK**

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**1. I have been involved in active clinical duties, in an African emergency care setting, at least once a week for the last month.**

- ☐ Yes [continue to page 3]
- ☐ No [continue to page 7, no participation in remainder of survey]

---

## **PAGE 3: PERSONAL INFORMATION AND DEMOGRAPHICS**

---

**1. Age:**

(years)

**2. Gender (select one):**

- ☐ Female
- ☐ Male
- ☐ Do not wish to disclose

**3. Country of emergency care work (list all):**

**4. Educational level completed (select all that apply):**

- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Completed specialist training
- ☐ Doctorate degree

**5. Current position/rank held (select one):**

- ☐ Intern
- ☐ Resident/registrar/specialist trainee
- ☐ Specialist
- ☐ Consultant

**6. Number of years' experience in the medical field since qualifying for bachelor's degree:**

(years)

**7. What type of mobile phone do you have access to? (select one)?**

- ☐ I have access to a smart phone [continue to page 4]
- ☐ I have access to a mobile phone that can only send text messages [continue to page 4]
- ☐ I do not have access to a mobile phone [continue to page 6, no participation in remainder of survey]

---

## **PAGE 4: SOCIAL MEDIA USE**

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**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

**1. How often do you use social media platforms to SOLICIT real-time advice from other clinicians?**

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Yearly
- ☐ Never

**2. How often do you use social media platforms to PROVIDE real-time advice to another clinicians?**

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Yearly
- ☐ Never

**3. Please indicate which of the following social media applications are currently installed on your smart phone.**

- ☐ WhatsApp
- ☐ Telegram
- ☐ Facebook Messenger
- ☐ Twitter
- ☐ Other social media applications. Please list all:

--

**3. Rank social media applications installed on your smart phone in terms of frequency of use for PERSONAL/SOCIAL purposes**

6.
7.
8.
9.
10.

**5. Rank social media applications installed on your smart phone in terms of frequency of use for WORK-RELATED purposes (clinical care, soliciting advice, etc.)**

1.
2.
6.
7.
8.

**6. How often do you use social media platforms to solicit real-time advice FROM other clinicians?**

- ☐ Daily, frequent use (more than 5 times)
- ☐ Daily, infrequent use (less than 5 times)
- ☐ Weekly (4 days or more per week)
- ☐ Weekly (3 days or less per week)
- ☐ Monthly
- ☐ Rarely (less than monthly)
- ☐ Very rarely (less than yearly)
- ☐ Never

**7. How often do you use social media platforms to provide real-time advice TO other clinicians?**

- ☐ Daily, frequent use (more than 5 times)
- ☐ Daily, infrequent use (less than 5 times)
- ☐ Weekly (4 days or more per week)
- ☐ Weekly (3 days or less per week)
- ☐ Monthly
- ☐ Rarely (less than monthly)
- ☐ Very rarely (less than yearly)
- ☐ Never

**8. How often do you use social media platforms to look up information related to a clinical situation/ presentation?**

- ☐ Daily, frequent use (more than 5 times)
- ☐ Daily, infrequent use (less than 5 times)
- ☐ Weekly (4 days or more per week)
- ☐ Weekly (3 days or less per week)
- ☐ Monthly
- ☐ Rarely (less than monthly)
- ☐ Very rarely (less than yearly)
- ☐ Never

---

**PAGE 4: ATTITUDES TOWARD THE USE OF SOCIAL MEDICA PLATFORMS IN THE CLINICAL SPACE**

---

Please indicate how much you agree to each of the following statements. If you are not able to answer a question, please select “Not applicable”.

**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

LEVEL OF AGREEMENT	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
1. Social media platforms are useful in general during clinical situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Social media platforms can facilitate <b>APPROPRIATE</b> clinical information during clinical encounters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Social media platforms can facilitate <b>QUALITY</b> clinical information during clinical encounters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



4. Social media platforms use in clinical situations carries risk to the <b>CLINICIAN</b> , such as medico-legal risk in case of unintended information loss, or incorrect management resulting in harm, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Social media platforms use in clinical situations carries risk to the <b>PATIENT</b> , such as unintended information loss, incorrect management resulting in harm, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## PAGE 5: SOCIAL MEDIA PLATFORMS AND THE CLINICIAN

Please indicate how much you agree to each of the following statements. If you are not able to answer a question, please select “Not applicable”.

**Note:** For the purpose of this study, social media platforms are defined as “*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*” (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

LEVEL OF AGREEMENT	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
1. There is a strong physician community that I can access through social media platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Social media platforms' use in clinical situations allow for safer clinical care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Social media platforms' use in clinical situations allow for improved quality of care (performance, communication, accessibility, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Social media platforms' use in clinical situations allow for improved efficiency (getting required information faster, speeding up care, matching the right care at the	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

right time for the right clinical effect).						
5. Social media platforms' use in clinical situations reduce the cost of care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Using social media platforms improve my job performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Using social media platforms increase my job productivity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Using social media platforms enable me to care for patients more effectively (achieving more productive consultations within a shorter time).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I actively seek new ways to use social media platforms in my clinical practice, by exploring new technologies and including more applications on my smart phone.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I am concerned that using social media platforms in my clinical practice will consume too much time and that this will affect my clinical productivity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## PAGE 6: SOCIAL MEDIA PLATFORMS AND THE PATIENT

Please indicate how much you agree to each of the following statements. If you are not able to answer a question, please indicate "Not applicable".

**Note:** For the purpose of this study, social media platforms are defined as "*Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time*" (Charalambous, 2019). Social media conducted through both mobile applications and online websites is included in this definition.

LEVEL OF AGREEMENT	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
1. I always obtain written consent from the patient (or their next of kin if the patient is unable to consent) before using clinical information in social media platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I always obtain verbal consent from the patient (or their next of kin if the patient is unable to consent) before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

using clinical information in social media platforms.		
3. I always delete all clinical information from my smart phone after each clinical encounter.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>
4. I have received objections from patients (or their next of kin) from using their clinical information to solicit advice using social media platforms.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>
5. I have received complaints from patients (or their next of kin) from using their clinical information to solicit advice using social media platforms.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>

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## PAGE 7: SURVEY COMPLETION

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This marks the end of the survey. Thank you for your time and participation. Your responses will help our team in improving understandings of how social media is used in facility-based emergency care in Africa.

## Appendix 4.1: Semi-structured facilitation guide

### DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA Intention-to-Use Interview

*Note that the following questions will be finalised upon analysis of the self-reported survey. Questions below are to be used as a guide for the Committee to appreciate the nature of intended questions. We do not foresee it changing in any major way and changes would likely involve reducing the number of questions rather than adding any new material.*

*The following questions will serve as a guide for the researcher to gather information and opinions surrounding the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa. The investigator may ask unscripted follow-up questions if needed; he or she may also rephrase questions for clarity to non-native English speakers as needed. The discussion will be audio recorded and the researcher may take handwritten notes to supplement the recording.*

*Prior to commencing discussions, the researcher will inform participants of the purpose of this study, associated risks and benefits, and how their confidentiality will be maintained. Written informed consent will be received from all participants who wish to participate. Participants will be reminded that their honest opinions are valued in this space and that there are no right or wrong answers.*

#### **Part 1: Building rapport with participants**

1. Please describe your current job title and job duties.
2. Please describe the setting in which you practice.

#### **Part 2: Personal social media usage**

*Discuss this study's definition of social media platforms with the participant: "Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time" (Charalambous, 2019).*

3. Which social media platforms do you use regularly (more than once per month) outside of your professional practice?
4. Which social media platforms do you use regularly (more than once per month) as

part of your professional clinical practice?

5. In what ways do you use [each application] in your professional clinical practice?
6. Why do you use [each application] in your professional clinical practice?

**Part 3: Social media in the emergency care setting**

7. How do you feel social media affects your point-of-care practice?
8. Can you describe your co-workers' and direct supervisors' opinions of using social media in real-time clinical practice?
9. Can you describe any policies, recommendations, or regulations governing social media use in your place of practice?
10. What do you think are the potential risks involved with using [each application] in real-time clinical practice? Benefits?
11. How do you think those risks compare to those benefits in terms of their gravity, and the potential to either harm or enhance real-time clinical practice?

**Part 4: Enhancing the use of social media in clinical emergency care**

12. What are current barriers and facilitators to using social in real-time clinical practice?
13. What would help to enhance the use of social media in clinical emergency care?

## Appendix 4.2: Interview consent form

### **DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA**

#### **Intention-to-Use Interview**

### **INTRODUCTION TO THE STUDY**

You are being invited to participate in a research project. The study is interview-based, and this interview is one of several that seek to gain information on the perceptions of emergency care practitioners regarding risks and benefits of social media use to enhance real-time care in facility-based settings. The information gathered from the study will be used in conjunction with data gathered from a self-response survey and other studies to describe a provisional framework for safe usage of social media in the facility-based African emergency care settings.

### **PARTICIPATION IN THIS STUDY**

Your participation in this project is voluntary. You should understand that you won't be paid for participation and may withdraw at any time without penalty. If you feel uncomfortable in any way during the interview, you have the right to decline to answer any question or end the interview. This is a one-time interview that will be audio-recorded and transcribed. You will not, however, be identified by name in any reports using info obtained from this interview, and names of any other participant or colleague you mention in the interview will also be reported anonymously. However, please understand that while the researchers will make all reasonable attempts to protect your privacy, such protection cannot be 100% guaranteed. No one other than researchers on this project will be present during the interview or will have access to raw notes or transcripts produced from the interview. The study has been reviewed and approved by the University of Cape Town Human Research Ethics Committee (REF NO: XXXX).

### **CONTACT INFORMATION**

Should you have any questions or concerns, you can contact the principal investigator, Prof Lee Wallis, at tel. +27 21 815 8818 or email [lee.wallis@uct.ac.za](mailto:lee.wallis@uct.ac.za).

If you any concerns or complaints remain regarding your rights and welfare as a study participant that have not been adequately addressed by the study investigators, you can contact Prof. Marc Blockman, Chair of the University of Cape Town Human Research Ethics Committee at tel. +27 021 406 6338 or email [marc.blockman@uct.ac.za](mailto:marc.blockman@uct.ac.za).

### **INFORMED CONSENT DECLARATION: PARTICIPANT**

By signing below, I \_\_\_\_\_ agree to take part in a research study titled “Evaluation of the Use of Social Media as a Point-of-Care Telemedicine Tool in Facility-Based Emergency Care in Africa”.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions, and all of my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressured to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed on (*date*) \_\_\_\_\_

**Signature of participant:** \_\_\_\_\_

#### **INFORMED CONSENT DECLARATION: INTERVIEWER**

I (*name*) \_\_\_\_\_ declare that:

- I explained the information in this document to (*participant name*):  
\_\_\_\_\_
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.

Signed on (*date*) \_\_\_\_\_

**Signature of interviewer:** \_\_\_\_\_

**Appendix 4.3:** University of Cape Town Human Research Ethics Committee approval for  
“Describing the use of social media as a point-of-care tool in facility-based emergency  
care in Africa”



**UNIVERSITY OF CAPE TOWN**  
**Faculty of Health Sciences**  
**Human Research Ethics Committee**



Room G50- Old Main Building  
Groote Schuur Hospital  
Observatory 7925  
Telephone [021] 406 6492  
Email: [hrec-enquiries@uct.ac.za](mailto:hrec-enquiries@uct.ac.za)

Website: [www.health.uct.ac.za/fhs/research/humanethics/forms](http://www.health.uct.ac.za/fhs/research/humanethics/forms)

03 March 2021

**HREC REF: 036/2021**

**Prof L Wallis**

Division of emergency Medicine  
F51 OMB  
Email: [lee.wallis@uct.ac.za](mailto:lee.wallis@uct.ac.za)  
Student: [erdoc999@gmail.com](mailto:erdoc999@gmail.com)

Dear Prof Wallis

**PROJECT TITLE: DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE  
TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA-PHD DR A  
ABDELRAHMAN-SUB-STUDY LINKED TO 464/2017-STUDY 3**

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

**This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, dated 17 March 2020 & 06 July 2020.**

**Approval is granted for one year until the 30 March 2022.**

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: [www.health.uct.ac.za/fhs/research/humanethics/forms](http://www.health.uct.ac.za/fhs/research/humanethics/forms))

**The HREC acknowledge that the student: Dr Abdelmonim Abdelrahman will also be involved in this study.**

**Please quote the HREC REF 036/2021 in all your correspondence.**

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

HREC/REF 036/2021sa



#### **Appendix 4.4:** University of Cape Town study proposal (FHS015)

### **DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA**

**Student:** Abdelmonim Abdelrahman, MD, LMS(Madrid), MMedSci, FRCS(Edin), MRCEM, MHPE

UCT Student Number: ABDABD024

Email: [er999doc@gmail.com](mailto:er999doc@gmail.com)

Candidate for PhD in Emergency Medicine

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Department of Family and Community Medicine, King Saud University, Riyadh, Saudi Arabia

**Supervisor:** Professor Lee A Wallis, MBChB, MD, FRCEM

UCT Staff Number: 01401390

Email: [lee.wallis@uct.ac.za](mailto:lee.wallis@uct.ac.za)

Division of Emergency Medicine, University of Cape Town

## **DECLARATION**

I, Abdelmonim Abdelrahman, hereby declare that the work on which this proposal is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

I empower the university to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

**Signature:**



**Date:** 07 January 2021

## **ABSTRACT**

### **Introduction**

The potential of social media to improve health communication and health information sharing between clinicians in emergency care in low-resource settings (LRS) cannot be underestimated. Social media, including mobile applications and online websites, is already informally used in LRS to provide real-time clinical support to emergency care providers, who might otherwise lack adequate training or access to information. It is unlikely that this practice can be halted, despite arguably valid concerns based largely on legality, and existing evidence suggests that the benefits to its use outweigh associated risks. It is likely that contextually appropriate guidance on the application of social media to healthcare would yield safer use; this would be especially impactful in LRS, where there is strong, anecdotal evidence of uncontrolled use of social media as a point-of-care telemedicine tool in emergency care.

In order to do this, its scope of use must be better understood, but no study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa. There is a need for in-depth investigation into the currently undocumented use of social media for point-of-care telemedicine throughout Africa. Such a study will provide insight into how clinicians are obtaining clinical insight from other providers and allow for the development of guidance on safe and effective social media for use in healthcare knowledge sharing and seeking.

This PhD aims to fully describe the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa.

### **Methods**

A scoping review was conducted to map the available literature on the use, results, benefits and risks associated with social networking as a point-of-care telemedicine platform as part of a scoping review. Following this, a sequential quantitative-qualitative mixed methods approach will be taken to obtain a comprehensive description of the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa. First, a self-reported, cross-sectional survey describing the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care telemedicine tool will be administered to African emergency care practitioners. Finally, in study three, semi-structured interviews will be conducted to gain an understanding of African clinicians' views, attitudes and behaviours towards social media use to enhance bedside emergency care. Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

**We are currently applying for ethical approval for study three of the PhD.**

### **Ethical considerations**

Ethical approval will be obtained from UCT HREC prior to beginning this study.

No part of the study will use or encourage the use of social media in clinical or other professional settings; all parts of this research will provide simple descriptions of current practices surrounding the use of social media. As described in the motivation, it is likely that this practice is already fairly pervasive within the clinical setting. This research provides the opportunity to describe the extent of social media use to enhance clinical care at a critical junction of the patient journey. Information gained from this study would likely improve our understanding of perceived risks and benefits; matched against existing, described risks and benefits would allow a more considered response to managing the practice. Legal implications related to privacy and clinical risk should not be of concern in an observational design such as this.

*Risks and benefits:* A key risk is that subjects may be identifiable from the content of the interviews later provided in reports. Subjects will be asked to answer questions on their use of social media in healthcare settings, whether or not this use is sanctioned by the system in which they practice. It is likely that during these interviews, participants may use an example of a real clinical event known to others. While we do not anticipate subjects to be identifiable post-hoc, or to be negatively affected by participating in these interviews, interviewers will ensure all participants understand that full anonymity cannot be guaranteed and therefore that they are free to not answer any questions they feel uncomfortable with or end the interview at any time. We do believe this is a small risk as events referred to during interviews are likely to refer to fairly general presentations. We do intend to be cautious where events are referring to more specific presentations, although we do not anticipate this to be the norm. We believe that this study is a relatively safe way to build on the findings from part 2 and deepen our understanding of social media use within the research context. The opportunity to understand the motivations behind social media use to enhance emergency or critical care will be beneficial not only to policy makers, but researchers and tele-communication developers.

*Consent process:* Participation in these interviews is entirely voluntary, and participants will be fully informed of the study before they are asked to sign a consent form (Appendix A).

*Privacy and confidentiality:* No names or other identifying information will be collected. The interviews will be conducted remotely, and the recordings will be kept confidential. Once the interviews have been transcribed, they will be completely de-identified, and the recordings will be erased. All data gathered will be stored securely.

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## INTRODUCTION

### Background

Growing evidence suggests an important role for emergency care in accelerating progress on global health priorities and narrowing health disparities (1-5). The World Bank's Disease Control Priorities project estimates that of the 45 million deaths per year in low- and middle-income countries (LMICs), 54% are due to conditions that are potentially addressable through prehospital and/ or emergency unit (EU) care (1). This translates to a staggering 932 million years of life lost to premature mortality and over a million disability-adjusted life years (1). Despite this, emergency care has remained virtually absent from the global health agenda, as most initiatives – particularly in low-resource settings (LRS) - have emphasised prevention, primary care, and vertical approaches to disease control.

This lack of prioritisation manifests in many ways within emergency care, not the least of which is a significant shortage of adequately trained facility-based staff to populate EUs (6, 7). The majority of African countries have not recognised emergency medicine as a medical specialty in its own right, and the few that have only did so in the last decade (6). Regardless, EUs in most of the continent are largely staffed by rotating or junior clinical personnel, who are often poorly equipped to handle the wide variety of acute presentations with the limited resources available to them (8). Educational and training opportunities are not accessible or inadequate and this is further compounded by extremely limited access to best practice information or guidance appropriate for clinicians in LRS.

The internet is a powerful tool for education and for information sharing, and internet penetration rates and connection speed throughout Africa have seen dramatic increases recent decades. The continent's internet penetration rate, which was 42.2% in June 2020, has seen a 12,441% increase between 2000 and 2020 (9). Despite these improvements, compared to the rest of the world, internet usage rates are well below average: The global average penetration rate is approximately 62.0%, with high-income countries (HICs) reaching well above 90% (9, 10). Many African countries – particularly the lowest-income and those in conflict areas – have very low overall internet access and poor internet infrastructure (9, 10). Interestingly, those African countries that are experiencing growth in broadband and mobile technology in particular appear to roughly correlate with the list of countries with active growth of emergency care systems and functionality. Botswana, Egypt, Ethiopia, Ghana, Mozambique, Rwanda, South Africa, Sudan, Ethiopia, Tanzania, Uganda, and Zimbabwe are currently the only countries out of 52 with established emergency medicine training programmes, though some of these are for training specialist physicians and others only have non-specialist offerings (11). South Africa has both the most developed emergency care systems on the continent, and one of the highest broadband and mobile internet usage rates (9, 10, 12).

With growth in internet use in general comes marked growth in the popularity of social media sites and applications, both worldwide and in Africa. The number of Facebook

users in Africa was estimated at approximately 213 million individuals in 2020, up 64.5% since 2015 (13). Nearly the same number – 192 million – are noted to use Africa’s most popular messaging app, WhatsApp (14). Many of these sites and applications are commonly used around the world by healthcare practitioners and students (15). In HICs, the use of social media by facility-based clinicians to inform healthcare decision-making has been well-documented (15) (16-18). Clinicians report using social media in a range of ways, include finding and exchanging information, directly communicating or networking with colleagues, disseminating research findings, participating in health advocacy, and marketing a product or practice (15, 18). In addition, some use social media to directly interact with patients or to gather patients’ personal information when traditional sources of information are exhausted. For example, a study of paediatric faculty and trainees in the United States found that between 14% and 18% of trainees had conducted an internet or social media search for information about a patient, and 14% of faculty stated they would use the internet to determine necessary additional patient information (19). A 2009 study describing the effect of social media internet tools on junior physicians’ daily clinical practice reports Google and Wikipedia use by 80% and 70% of physicians, respectively (20). A 2013 systematic review identified six key overarching benefits of social media use in a clinical setting: increased interactions with others, more available, shared and tailored information, increased accessibility and widening access to health information, peer/social/emotional support, public health surveillance, and the potential to influence health policy (21). In the context of the COVID-19 pandemic, healthcare-related social media use has skyrocketed: Providers are leveraging social media to disseminate critical information and connect with those in need of care (22).

Physicians’ use of social networking as a tool to crowdsource answers to clinical questions has been of particular interest, as it has the potential to enhance real-time clinical care in settings where other sources of information are limited or unavailable. Two examples of this application in the United States healthcare system are Sermo ([www.sermo.com](http://www.sermo.com)) and Doximity ([www.doximity.com](http://www.doximity.com)) (23). Sermo is an online social networking community where “physicians across all 50 states in the US representing 68 specialties come to network, discuss treatment options, and curb side peers for expert advice whenever they need it” (23) Doximity, a newer physician-only social networking community, allows users to search a database of healthcare providers, and supports point-of-care crowdsourcing via Health Insurance Portability and Accountability Act (HIPAA)-compliant messaging within this database (23).

The potential benefits of social media in clinical practice are ample and have been described in observational studies in some settings; however, there are limitations and risks inherent to this type of information sharing and seeking that have not been studied in-depth (15, 18-21). Numerous institutional statements and practical guidelines have emerged as the social media landscape has developed, and many studies on social media use in healthcare include best practice recommendations (15, 24-29). A 2012 review of social media use by clinicians found that two types of risk are prevalent and



thus of major concern: breaches of patient confidentiality and publication of unprofessional content (30). Other issues with healthcare-related social media used include high levels of low-quality information and lack of quality oversight, licensing issues, liability, and legal grey areas stemming from the rapid emergence and evolution of social media use. Use of social media tools for physician education in emergency care is under-reported. One study of the integration of social media into emergency medicine residency curricula surveyed 226 residents across 12 different US residency programs and found that 98% used some sort of social media learning at least one hour per week (31). However, the types of modalities described are limited to blogs, podcasts, and video casts, none of which are of much particular use in real-time clinical care. Other literature on social media use in emergency care is sparse, particularly for one-on-one communication with other professionals or point-of-care information-seeking.

Social media use could have value in LRS as a telemedicine tool, especially in LRS where health education infrastructure cannot provide the level of support, mentorship, and information required to maintain clinical best practices. Indeed, there is strong anecdotal evidence in the African emergency care community that suggests it is already used extensively for these purposes within African EUs. However, an educated understanding of the prevalence of use, and the benefits and risks of social media use to inform frontline clinical emergency care in real-time lacks in this setting.

Note that, for the purpose of this PhD, social media is being evaluated in the context of its utility as a real-time point of care telemedicine tool. A range of platforms may serve this function, including those that support instant messaging (e.g. WhatsApp, Facebook Messenger and Telegram) as well as others that allow for the posting of text and multimedia in forums (e.g. Facebook) (32). The following definition of social media will be adhered to throughout this work: “Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time” (33, 34).

## **6.1 Motivation**

The potential of social media to improve health communication and health information sharing in emergency care in LRS cannot be underestimated. Social media, including its mobile applications, are already informally used in LRS to provide real-time clinical support to emergency care providers, who otherwise lack adequate training or access to information. It is unlikely that this practice can be halted, despite arguably valid concerns based largely on legality, and existing evidence suggests that the benefits to its use outweigh associated risks (30). It is likely that contextually appropriate guidance on the application of social media to healthcare would yield safer use; this would be especially impactful in LRS, where there is strong, anecdotal evidence of uncontrolled use of social media as a point-of-care telemedicine tool in emergency care.

In order to do this, its scope of use must be better understood, but no study has described the type and extent of social media use by facility-based providers for real-time emergency care in Africa. There is a need for in-depth investigation into the currently undocumented use of social media for point-of-care telemedicine throughout Africa. Such a study will provide insight into how clinicians are accessing clinical information that is not locally available but considered important for acute care and allow for the development of guidance on safe and effective social media for use in healthcare knowledge sharing and seeking.

## **6.2 Aim and objectives**

This PhD aims to fully describe the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa.

It has the following objectives:

4. To describe, through a scoping review, the effectiveness, benefits and risks pertaining to the use of social media as a point-of-care telemedicine tool for emergency care globally. (**Study one – already completed**)
5. To describe, through a survey, the prevalence of use, particular social media platforms used, user demographics and specific usage of social media as a point-of-care telemedicine tool by emergency care providers in Africa. (**Study two – approved by HREC, in process**)
6. To describe, through interviews, the perception of the risks and benefits, and barriers and facilitators, and intention-to-use of social media as a point-of-care telemedicine tool for emergency care. (**Study three – subject of this application**)

Post-doctoral work will focus on the development of a framework to guide use of social media in facility-based emergency care in the African setting.

**We are currently applying for ethical approval for study three of the PhD.**

## **7. METHODS**

7.1 Study one: Scoping review on the use of social media as a point-of-care telemedicine tool for emergency care practitioners worldwide.

### **7.1.1 Aim and objectives**

Study one aimed to assess the existing literature base for information on the use of social media as a point-of-care telemedicine tool for emergency care practitioners worldwide.

It had the following objectives:

1. With regard to the use of social media platforms for real-time clinical consultation by emergency care practitioners:
  - a. Identify what social media platforms are currently being used
  - b. Evaluate their potential impacts on patient outcomes.
  - c. Describe the risks and benefits associated with their use.

- d. Identify facilitators and barriers for their use.
2. Identify gaps in the literature on the relationship between the use of social media and efficacy of clinical care in EUs.

This review was subject to ethical approval in 2017 (HREC REF 464/2017). It has been completed and is being written up for publication in a peer reviewed journal.

## **7.2 Study two: Survey-based assessment of the use of social media as a point-of-care telemedicine tool by facility-based emergency care practitioners in Africa.**

### **7.2.1 Aim and objectives**

Study two aims to broadly describe the use of social media as a point-of-care telemedicine tool by emergency care practitioners in Africa. It is the first phase (quantitative) of a two-phase sequential quantitative-qualitative mixed methods approach being taken to obtain a comprehensive description of the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa (35).

It has the following objectives:

5. Describe the demographic characteristics of African emergency care practitioners that use social media as a point-of-care telemedicine tool.
6. Quantify prevalence of use of various social media platforms by African emergency care practitioners.
7. Describe African emergency care practitioners' social media usage habits and practices.
8. Understand African emergency care practitioners' attitudes towards use of social media in facility-based emergency care.

This study was subject to ethical approval in 2020 (Sub-study linked to HREC REF 464/2017). Research efforts are currently underway.

## **7.3 Study three: Qualitative assessment of the use of social media as a point-of-care telemedicine tool by facility-based emergency care practitioners in Africa.**

### **7.3.1 Aim and objectives**

Study three aims to describe facility-based African emergency care practitioners' perception of, and intention to use, social media as a point-of-care telemedicine tool. It is the second phase (qualitative) of a two-phase sequential quantitative-qualitative mixed methods approach being taken to obtain a comprehensive description of the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa (35).

It has the following objectives:

1. Describe intentions to use social media as a point-of-care telemedicine tool in facility-based African emergency care.
2. Describe perceived facilitators and barriers to using social media as a point-of-care telemedicine tool in facility-based African emergency care.
3. Describe perceived risks and benefits to using social media as a point-of-care telemedicine tool in facility-based African emergency care.
4. Describe potential impacts of using social media as a point-of-care telemedicine tool in facility-based African emergency care.

### 7.3.2 Study design

This is an exploratory qualitative study involving thematic analysis of in-depth, semi-structured interviews to gain an understanding of African clinicians' views, attitudes and behaviours towards social media use to enhance bedside emergency care. In these interviews, we will explore what social media emergency care practitioners use, why, how and when they use it. We will also explore the gained benefits of the social media use as well as the risks they attach to its use.

### 7.3.3 Study population and sampling

Recruitment will be non-probability and purposive, by convenience sampling of study two survey respondents expressing willingness to participate in a follow-up interview, with an aim to reach qualitative saturation (estimated to be approximately 10 interviews). Provisional inclusion criteria is any clinician with at least one year of self-reported cumulative experience using social media to share, distribute, or seek – in real-time – answers to clinical emergency or critical care questions in the African emergency care setting. Attention would be given to ensure subjects represent the full spectrum of African income and practice settings. If necessary, follow-up recruitment will be done through snowball sampling during the interviews or using author contact information identified in relevant literature. This technique is particularly effective in studies of early adopters since there are usually few individuals involved: they are usually the best resource for determining who else is involved in the field.

Potential participants will be identified from the pool of respondents in study two that opted in to be contacted about a follow-up interview. Their contact information will be exported from SurveyMonkey in a file that does not contain any of their previous responses. These participants will be sent a standardised email, informing them of the purpose of the study and consent information. Video interviews will be set up and conducted upon positive response to this initial request.

### 7.3.4 Data collection and management

Interviews have been selected as the primary method of data collection because this approach encourages open information exchange and targeted follow-up questions (36). One-on-one video interviews between participants identified from study two and a researcher will be recorded and transcribed for analysis. Given the aim of this study to capture information about social media use in emergency care throughout the continent,

these interviews will be remotely hosted on Microsoft Teams, a secure conferencing platform. Interviews will be primarily conducted in English; however, when needed; a translator will be used. Interviews are expected to last approximately one hour. Prior to beginning, the interviewer will review the study and obtain written informed consent from those who choose to participate via e-signature (Appendix A).

Only broad themes will be introduced in the Interviews to encourage maximum flow of dialogue and flexibility of response. A qualitative approach to interviewing allows interviewees to “respond in their own words”, and “to express their own personal perspectives” (36). Moreover, this form of systematic interviewing minimises interviewer effects. According to Seale, the less structured the interview, the more the participants will be able to identify and concentrate on the most significant aspects of their experiences (36). A provisional interview guide is presented in Appendix B. Interview questions are to be finalised upon completion of studies one and two but are not anticipated to change in any major way. Iterative pre-testing will be conducted with content experts prior to interviews commencing.

All interviews will be conducted remotely and recorded via Dictaphone with handwritten notes generated simultaneously. Full transcription of each interview will occur prior analysis. Themes will be identified from the notes immediately following interviews and organised into checklist matrices. Checklist matrices condense data into simple categories for coding. This method will then provide a summary of the interviewer’s perceptions that can later be checked against the fully transcribed transcripts to facilitate subsequent, more intensive analysis. Simultaneous data collection and analysis and the semi-structured nature of these interviews provide each interview has the potential to inform and enhance subsequent interviews. Interviews will continue until thematic saturation is reached.

#### 7.3.5 Data analysis

Data will be organised and analysed using NVivo11 qualitative analysis software (© QSR International, Burlington, MA, USA). As is recommended by SAGE, analysis of the full transcript data will begin by dividing the interviews into ‘meaning units’, or segments of text that each contain one main idea (36). Each unit from each interview will be labelled with terms similar to those used by the interviewee, and then the labels across multiple interviews combined into larger descriptive categories. Clusters should then arise, made up of several descriptive units, which can be numerically assigned for coding. This will be finalised with a qualitative researcher before analysis commences. Data will be analysed independently by both the interviewer and a second researcher. Member checks will be conducted via email with individual participants to ensure that data accurately reflect participants’ described experiences. Results of the qualitative and quantitative portions of this PhD will be compared to methodologically triangulate results (35).

### 7.3.6 Limitations

Language barriers may also be a factor in interviews. As all AFEM activities are conducted and communicated in English, it is hoped that a large proportion of the participants will understand a sufficient amount of English to be able to adequately converse during the interview. It is also suspected and hoped that those most vocal about social media will be confident English speakers, as English is the medium used for publicising and disseminating opinions and outputs across practice settings on much of the continent. A bias may be introduced, however, by exclusion of participants who may have provided good insight but have a poor grasp of spoken or written English. For this reason, the study team will try to leverage AFEM's network of researchers to identify multilingual interviewers where possible and necessary.

### 7.3.7 Ethical considerations

Ethical approval will be obtained from UCT HREC prior to beginning this study.

No part of the study will use or encourage the use of social media in clinical or other professional settings; all parts of this research will provide simple descriptions of current practices surrounding the use of social media. As described in the motivation, it is likely that this practice is already fairly pervasive within the clinical setting. This research provides the opportunity to describe the extent of social media use to enhance clinical care at a critical junction of the patient journey. Information gained from this study would likely improve our understanding of perceived risks and benefits; matched against existing, described risks and benefits would allow a more considered response to managing the practice. Legal implications related to privacy and clinical risk should not be of concern in an observational design such as this.

*Risks and benefits:* A key risk is that subjects may be identifiable from the content of the interviews later provided in reports. Subjects will be asked to answer questions on their use of social media in healthcare settings, whether or not this use is sanctioned by the system in which they practice. It is likely that during these interviews, participants may use an example of a real clinical event known to others. While we do not anticipate subjects to be identifiable post-hoc, or to be negatively affected by participating in these interviews, interviewers will ensure all participants understand that full anonymity cannot be guaranteed and therefore that they are free to not answer any questions they feel uncomfortable with or end the interview at any time. We do believe this is a small risk as events referred to during interviews are likely to refer to fairly general presentations. We do intend to be cautious where events are referring to more specific presentations, although we do not anticipate this to be the norm. We believe that this study is a relatively safe way to build on the findings from part 2 and deepen our understanding of social media use within the research context. The opportunity to understand the motivations behind social media use to enhance emergency or critical care will be beneficial not only to policy makers, but researchers and tele-communication developers.

*Consent process:* Participation in these interviews is entirely voluntary, and participants will be fully informed of the study before they are asked to sign a consent form (Appendix A).

*Privacy and confidentiality:* No names or other identifying information will be collected. The interviews will be conducted remotely, and the recordings will be kept confidential. Once the interviews have been transcribed, they will be completely de-identified, and the recordings will be erased. All data gathered will be stored securely.

### 7.3.8 Reporting of results

The results of this study will be written in report form and provided to any interested parties (including AFEM and participating academic institutions) for review. They will also be written into a manuscript for publication. Finally, they will serve to inform post-doctoral work developing a framework to guide use of social media in facility-based emergency care in the African setting.

## 8. TIMELINE

Year	2021				2022			
Quarter	1	2	3	4	1	2	3	4
Study three								
Ethical approvals (EMDRC, HREC)	X	X						
Research preparation	X	X						
Data collection			X	X				
Data analysis				X	X			
Reporting and implementation of results					X	X		
Dissertation								
Dissertation preparation					X	X	X	X
Dissertation submission								X

## RESOURCES

### 10.1 Budget

Item	Description	Unit cost	N° of Units	Total cost (ZAR)
<b>Research materials</b>				
Interview equipment	Dictaphones	500	1	500
Stationary	Paper, printing, writing materials	250	1	250
Connectivity	Internet, phone minutes	250	1	500
<b>Total</b>				<b>31,250</b>

### 8.1 Funding

All costs associated with this study will be borne by the lead researcher (PhD student).



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## 10. APPENDICES

### Appendix A: Study three consent form

#### DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA Intention-to-Use Interview

#### INTRODUCTION TO THE STUDY

You are being invited to participate in a research project. The study is interview-based, and this interview is one of several that seek to gain information on the perceptions of emergency care practitioners regarding risks and benefits of social media use to enhance real-time care in facility-based settings. The information gathered from the study will be used in conjunction with data gathered from a self-response survey and other studies to describe a provisional framework for safe usage of social media in the facility-based African emergency care settings.

#### PARTICIPATION IN THIS STUDY

Your participation in this project is voluntary. You should understand that you won't be paid for participation and may withdraw at any time without penalty. If you feel uncomfortable in any way during the interview, you have the right to decline to answer any question or end the interview. This is a one-time interview that will be audio-recorded and transcribed. You will not, however, be identified by name in any reports using info obtained from this interview, and names of any other participant or colleague you mention in the interview will also be reported anonymously. However, please understand that while the researchers will make all reasonable attempts to protect your privacy, such protection cannot be 100% guaranteed. No one other than researchers on this project will be present during the interview or will have access to raw notes or transcripts produced from the interview. The study has been reviewed and approved by the University of Cape Town Human Research Ethics Committee (REF NO: XXXX).

#### CONTACT INFORMATION

Should you have any questions or concerns, you can contact the principal investigator, Prof Lee Wallis, at tel. +27 21 815 8818 or email [lee.wallis@uct.ac.za](mailto:lee.wallis@uct.ac.za).

If you any concerns or complaints remain regarding your rights and welfare as a study participant that have not been adequately addressed by the study investigators, you can contact Prof. Marc Blockman, Chair of the University of Cape Town Human Research Ethics Committee at tel. +27 021 406 6338 or email [marc.blockman@uct.ac.za](mailto:marc.blockman@uct.ac.za).

#### INFORMED CONSENT DECLARATION

By signing below, I ..... agree to take part in a research study titled “Evaluation of the Use of Social Media as a Point-of-Care Telemedicine Tool in Facility-Based Emergency Care in Africa”.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions, and all of my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressured to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ..... on ..... (*date*)  
.....

**Signature of participant:** .....

**Signature of witness:** .....

### **Declaration by investigator**

I (*name*) ..... declare that:

- I explained the information in this document to (*participant name*):  
.....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.

Signed at (*place*) ..... on (*date*) .....

**Signature of investigator:** .....

**Signature of witness:** .....

## Appendix B: Study three interview guide

### DESCRIBING THE USE OF SOCIAL MEDIA AS A POINT-OF-CARE TELEMEDICINE TOOL IN FACILITY-BASED EMERGENCY CARE IN AFRICA Intention-to-Use Interview

*Note that the following questions will be finalised upon analysis of the self-reported survey. Questions below are to be used as a guide for the Committee to appreciate the nature of intended questions. We do not foresee it changing in any major way and changes would likely involve reducing the number of questions rather than adding any new material.*

*The following questions will serve as a guide for the researcher to gather information and opinions surrounding the use of social media as a point-of-care telemedicine tool in facility-based emergency care in Africa. The investigator may ask unscripted follow-up questions if needed; he or she may also rephrase questions for clarity to non-native English speakers as needed. The discussion will be audio recorded and the researcher may take handwritten notes to supplement the recording.*

*Prior to commencing discussions, the researcher will inform participants of the purpose of this study, associated risks and benefits, and how their confidentiality will be maintained. Written informed consent will be received from all participants who wish to participate. Participants will be reminded that their honest opinions are valued in this space and that there are no right or wrong answers.*

#### **Part 1: Building rapport with participants**

- 14. Please describe your current job title and job duties.
- 15. Please describe the setting in which you practice.

#### **Part 2: Personal social media usage**

*Discuss this study's definition of social media platforms with the participant: "Internet-based tools that allow individuals and communities to gather and communicate, to share information, ideas, personal messages, images, and other content...to collaborate with other users in real time" (Charalambous, 2019).*

- 16. Which social media platforms do you use regularly (more than once per month) OUTSIDE of your professional practice?
- 17. Which social media platforms do you use regularly (more than once per month) as PART OF your professional clinical practice?
- 18. In what ways do you use [each application] in your professional clinical practice?
- 19. Why do you use [each application] in your professional clinical practice?

**Part 3: Social media in the emergency care setting**

- 20.** How do you feel social media affects your point-of-care practice?
- 21.** Can you describe your co-workers' and direct supervisors' opinions of using social media in real-time clinical practice?
- 22.** Can you describe any policies, recommendations, or regulations governing social media use in your place of practice?
- 23.** What do you think are the potential risks involved with using [each application] in real-time clinical practice? Benefits?
- 24.** How do you think those risks compare to those benefits in terms of their gravity, and the potential to either harm or enhance real-time clinical practice?

**Part 3: Enhancing the use of social media in clinical emergency care**

- 25.** What are current barriers and facilitators to using social in real-time clinical practice?
- 26.** What would help to enhance the use of social media in clinical emergency care?