

# Social Media as a Tool for Professional Development, Advancement and Presentation of Pharmacist Expanded Roles

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**Abstract:** *Background:* Social media are a useful tool to communicate health and science related issues and nowadays they are widely used by patient's organizations to promote their work. *Objective:* The objective of this study was to identify how pharmacists' roles were presented in the posts and tweets on social media for World Pharmacist Day (WPD) 2020-22. *Method:* A qualitative content analysis was used to evaluate the posts and tweets of pharmacists' roles on WPD 2020-22. Social media (Facebook, Instagram, and Twitter) posts and tweets were selected as the source. Posts were included that had a photo or image, used WPD hashtags (#WPD), and were posted on September 25, 2020-22. Thematic analysis was performed to identify, analyze, and interpret patterns of meanings of the photos and images. Photos and images were categorized into 6 groups: 1) patient care roles, 2) drug distribution roles, 3) multiple roles, 4) no described roles, 5) not professional roles, and 6) not relevant. *Results:* A total of 450 posts and tweets were analyzed. Forty percent described the drug distribution roles of pharmacists, whereas 35% represented patient care roles, 5% portrayed the multiple roles of the pharmacists and 20% did not describe any particular roles of pharmacists. *Conclusion:* There are many positive ways to use social media in healthcare, including promoting awareness and sharing accurate health messaging.

**Keywords:** Social Media, Pharmacist, World Pharmacist Day

## 1. Introduction

Internet usage is increasing around the world. As of 2023, the total number of internet users worldwide has continued to grow, reaching unprecedented levels. It is estimated that 4.76 billion active internet users worldwide (59.5 percent of the global population) [1] enabling them to connect, communicate, and access information like never before. What is particularly noteworthy is the remarkable surge in

mobile internet usage. With the proliferation of smartphones and the increasing affordability of mobile data plans, a significant portion of internet users, surpassing the majority, now access the internet through their mobile devices. The convenience and portability offered by mobile internet have transformed the way people interact with the online world, making it more accessible and pervasive across diverse regions and demographics. As a result, healthcare professionals and patients are increasingly using the Internet

to get health and drug information [2]. According to a 2013 national report, nearly 60% US adult population has used the Internet to search for health-related information over the past year [3].

The Internet, a vast global network of interconnected computer systems, is undergoing constant evolution, adapting and expanding to incorporate new features that shape the digital landscape [4]. This ever-changing nature of the Internet is fueled by technological advancements, user demands, and emerging trends. The introduction of new features has profoundly impacted various aspects of our lives, from communication and information access to commerce and entertainment. One significant development is the rise of social media platforms, enabling individuals to connect, share, and engage with a global audience. Significant transformations have taken place in the last decade when a unique idea known as Web 2.0 was emerged [5] (see Table 1). The general term "social media" appeared in the Web 2.0 collaboration environment. Social media (SM) has revolutionized the way people connect and communicate in the digital age. It has become an integral part of our daily lives, offering a platform for individuals to share ideas, opinions, and experiences with a global audience. Social media enables users to stay connected with friends, family, and colleagues, and provides a space for networking, entertainment, and self-expression. From sharing photos and videos to engaging in discussions and following the latest

trends, social media has transformed the way we interact and consume information. Facebook [6], the largest social media platform, continues to dominate the digital landscape with its massive user base. As of September 2021, Facebook reported over 2.91 billion monthly active users worldwide. Founded in 2004, Facebook offers a wide range of features including status updates, photo sharing, group discussions, and event organization. It has become a platform for connecting people, sharing content, and discovering new interests. Twitter [7], known for its succinct nature with a character limit per tweet, serves as a real-time public conversation platform. Founded in 2006, Twitter has evolved into a vital tool for news dissemination, discussions, and trend tracking. As of September 2021, Twitter reported approximately 330 million monthly active users. With its fast-paced and dynamic nature, Twitter allows users to share thoughts, engage in discussions, follow news updates, and connect with a diverse range of individuals and communities. Instagram [8], a subsidiary of Facebook, focuses primarily on visual content such as photos and videos. Launched in 2010, Instagram has gained immense popularity, particularly among younger demographics. As of September 2021, it had reached over 1.16 billion monthly active users. Instagram's user-friendly interface and emphasis on visual storytelling have made it a go-to platform for sharing personal moments, exploring creative content, and engaging with influencers and brands [9].

*Table 1. Some common Web 2.0 terms and their definition.*

Term	Definition
Web 2.0	The second generation of the World Wide Web, characterized by user-generated content, collaboration, and interactive communication.
Social Media	Online platforms and applications have emerged as facilitators for users to generate and distribute content, interact within social networks, and actively participate in various online communities.
Blog	A website or online platform where individuals or organizations can regularly publish articles, opinions, and personal reflections.
Microblogging	Posting and sharing short updates or messages, typically limited to a certain number of characters, on platforms like Twitter.
Social Networking	Online platforms that facilitate connections and interactions between individuals or groups, allowing them to share information and build relationships.
Social Bookmarking	Saving, organizing, and sharing bookmarks or web links to online resources using platforms like Delicious or Pocket.
Podcasting	Publishing and distributing audio or video content, such as interviews, discussions, or educational materials, in episodic form.
Wikis	Collaborative websites that allow users to contribute, edit, and organize content collectively, such as Wikipedia.
User-Generated Content	Content created and shared by users on various online platforms, including text, images, videos, reviews, and comments.
Crowdsourcing	Obtaining ideas, opinions, or contributions from a large group of people, often through online platforms, to solve problems or create content.
Virtual Communities	Online communities where individuals with shared interests or goals come together to interact, collaborate, and share information.
Web Applications	Software applications that run on web browsers, enabling users to perform tasks, access services, and interact with data over the internet.

Technological advancements have brought a significant transformation in the way health information is generated, retrieved, and used. The advent of the Internet, particularly in its early form known as Web 1.0, has empowered individuals to actively seek and engages with health-related content. This shift from "passive" recipients to "motivated" consumers of health information [10]; has enabled people to proactively search for and utilize knowledge pertaining to health and medicine. The Internet has therefore been a major factor in promoting awareness and knowledge between healthcare

professionals and the public. Currently, adequate knowledge is being shared with the people [11]. As recommended changes in healthcare systems are utilized after the coronavirus disease in 2019 (COVID19) [12], this change presents challenges and demands more Internet surveys and research on participatory consumers. As the technologies continues to evolve [13], and in this digital age, where information is readily accessible and communication is increasingly taking place in virtual spaces, SM has emerged as a powerful tool with immense potential to support

pharmacists in achieving these objectives. SM platforms offer a dynamic and interactive environment where healthcare professionals, including pharmacists, can connect, collaborate, and share their experiences and knowledge [14]. Through SM, pharmacists can not only stay updated with the latest advancements in their field but also contribute to the collective body of knowledge by actively participating in discussions, exchanging ideas, and engaging with colleagues worldwide.

The purpose of this article was to identify how people portrayed pharmacists' roles on Facebook, Twitter, and Instagram for WPD 2020-22. An understanding of the people's current knowledge on pharmacists' roles and practices about professional fields of pharmacy will elaborate policies to positively and more successfully use SM as a learning tool for presenting pharmacy practice as the main way to provide pharmacy-related services. By leveraging SM platforms, pharmacists can enhance their professional growth, expand their networks, and showcase their expertise to a wider audience. Furthermore, SM enables pharmacists to advocate for their expanded roles and drive meaningful changes in healthcare policies and practices, ultimately benefiting patient care.

## 2. Research Questions

The research team discussed that posting photos and images on SM reflect the pharmacist's behavior and overall impression of the pharmacist's profession, along with the following research questions:

- 1) What proportion of the posts on SM on WPD 2020-22 represented modern pharmacy practice and pharmacists' roles?
- 2) Which roles of pharmacists were advocated for on WPD 2020-22 by different users on SM?

## 3. Methods

To collect data from Facebook, Twitter, and Instagram on the utilization of SM as a tool for professional development, advancement, and presentation of pharmacist expanded roles, the following methodology was employed:

**Research Design:** This study utilized a qualitative research design to analyze the content shared on Facebook, Twitter, and Instagram related to pharmacist expanded roles. By examining posts, discussions, and interactions on these platforms, the study aims to gain insights into the nature and extent of engagement, as well as the types of content shared by people and their professional communities. Another advantage is that qualitative research allows investigators to take a closer look at the perspective of an individual with a small number of participants [15]. This research report followed the recommendations in the relevant section of the Qualitative Research Reporting Criteria [16]. The reliability of this study was assessed using a robust data collection and analysis process using NVivo software [17]. This allows you

to assign the encoding directly to a photo or image.

**Platform Selection:** Facebook, Twitter, and Instagram have been selected as they are popular and widely used social media platforms that provide opportunities for professional networking, knowledge sharing, and community building. These platforms offer a diverse range of content formats and interaction features that are relevant for the study.

### 3.1. Search Strategy for Data Collection

Content analysis was performed to evaluate the photos, images, and tweets being promoted of pharmacists' roles on WPD 2020-22 using a deductive approach. Social media (Facebook, Instagram, and Twitter) posts (photos, images) and tweets were selected as the source because of their public accessibility and ease of searching for and capturing the contents of individual hashtags. Photos and images were included in this study if they included a photo or image and used a WPD hashtag on 25 September 2020-22. We have individually collected five hashtags with different WPD variations: 1) #worldpharmacistday, 2) #worldpharmacistday2020, 3) #worldpharmacistsday2021, 4) #worldpharmacistsday2022, 5) #WPD2020, 5) #WPD2021 and 6) #WPD2022. Posts and tweets that did not contain photos or images or were irrelevant and did not describe any particular roles or professional roles of pharmacists were excluded from the analysis. The posts and tweets were cataloged using numerical order of capture and were stored in respective folders. Duplicates of posts were removed before analysis. All the authors decided not to include the photos and images of people's face as it was not possible to reach all people for getting consent to upload them online and instead refer the readers to social media web site links (Facebook, Twitter and Instagram) where they can find the information about patients care, drug distribution and multiple roles of the pharmacist.

The authors individually searched for posts and tweets that matched the above keywords with hashtags. The reviewers agreed to exclude posts and tweets that did not meet the aforementioned eligibility criteria, whereas those that met the eligibility criteria based on reviewers' assessments were included. Posts and tweets were reviewed independently by each reviewer against the inclusion and exclusion criteria. The reliability of pharmacists' expanded role photos, images, and tweets was determined by using an inter-rater reliability test through Delve Qualitative Analysis Tool [17]. In case of disagreement between the reviewers, the two reviewers (MAR and SA) who were an expert in pharmacy practice and practice-based research was asked to review the disagreement between the authors. However, there were no disagreements between the reviewers during the review process.

### 3.2. Data Analysis

Content analysis was performed independently by two investigators and posts and tweets were sorted into 6 categories (see Table 2):

**Table 2.** Categories of pharmacist roles with descriptions.

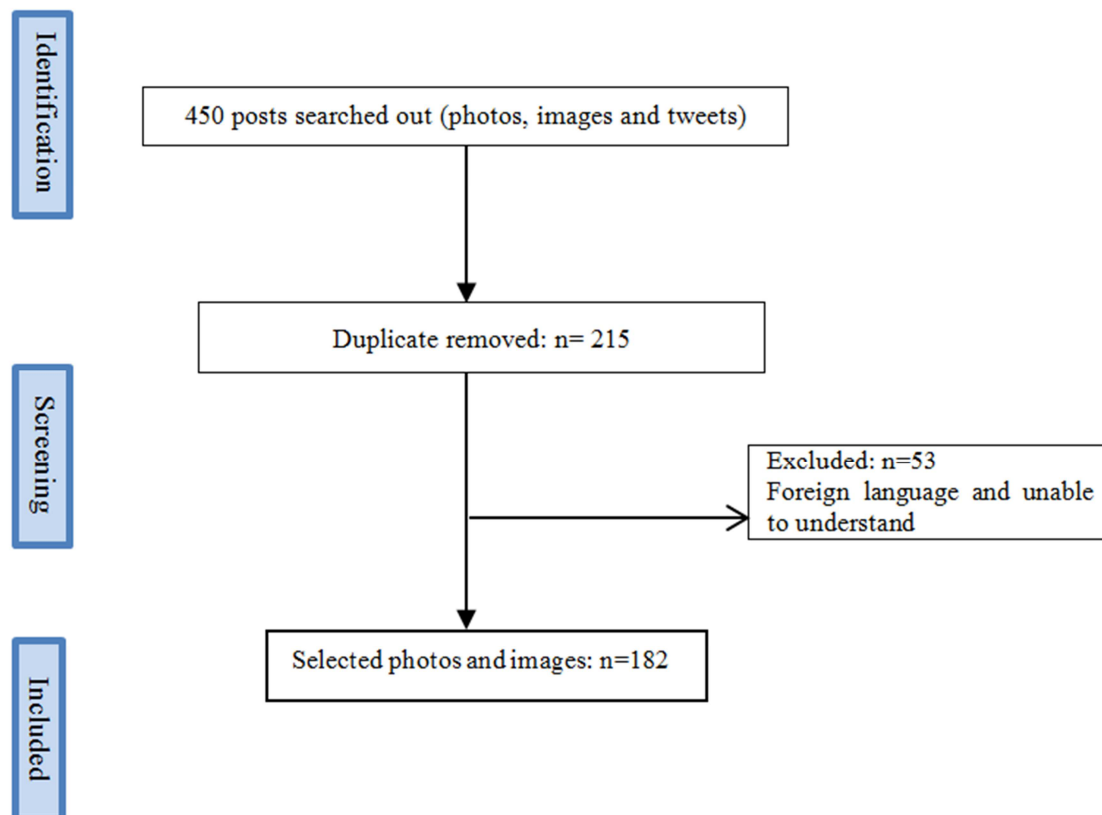
Category	Role description
Patient care role	The overall expected message is that the role of the pharmacist is not limited to drug distribution, but covers a variety of clinical and professional roles in patient care.
Drug distribution role	The overall expected message is that the role of the pharmacist is exclusively or primarily related to the dispensing, formulation, and/or manufacture of the drug.
Multiple roles	The overall expected message is that pharmacists play multiple roles in different situations around the world.
No role description	The projected image shows the pharmacist's profession or pharmacist, but there is no general statement about the pharmacist's role.
Non-professional role	The image is indistinguishable because the pharmacist is not considered to belong to the pharmacy profession or promote the specialty aspects of the pharmacy.
Irrelevant	The image has nothing to do with the pharmacist's profession or pharmacist.

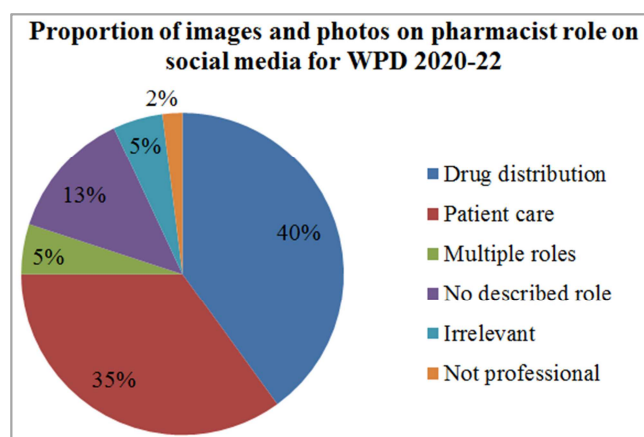
Data analysis was performed using Microsoft Excel and Computer-Assisted Qualitative Data Analysis Software (CAQDAS) NVivo. NVivo software was used as the codes could be assigned directly to the photos, images, and tweets, ensuring the codes remained linked to the specific photo, image, and tweets. The coding process was dynamic, iterative, and evolved throughout the analysis. Codes with a repeated pattern across the data (i.e., codes with similar or nearly similar meanings) were grouped into subthemes and later assembled into overarching themes. Themes were carefully named according to their overall content. Throughout the analysis, the research team discussed the coding process, including grouping into themes, with senior members. Statistical analysis was performed using SAS, and descriptive statistics such as counts and percentages were performed using Microsoft Excel [18]. Descriptive statistics such as a

pie chart were used for the proportion of images, photos, and tweets on pharmacist role on SM for WPD 2020-22.

## 4. Results

The electronic search based on the screening of photos and images yielded a total of 450 posts and tweets from 'Facebook' 'Instagram' and 'Twitter'. Initially, 450 photos, images, and tweets were identified; 215 duplicates and 53 photos and images using the ISO basic Latin alphabet were excluded, resulting in 182 photos, images, and tweets included in the final analysis. The study flowchart is illustrated in Figure 1. Cohen's kappa was calculated and was found to demonstrate substantial agreement (0.7165) with an average mean percentage inter-rater agreement of 90% and complete agreement of 76% respectively.

**Figure 1.** Study flowchart.



**Figure 2.** The proportion of images and photos on pharmacist role on social media for WPD 2020-22.

People were active in sharing information about pharmacist diverse roles such as distribution roles, patient care roles, and pharmacists' multiple roles. Overall, all shared photos, images, and tweets on Facebook, Twitter, and Instagram for WPD 2020-22 raised awareness or promoted pharmacists' modern roles. Forty percent focused on drug distribution roles whereas 35% presented the patient care roles, 5% described the pharmacists' multiple roles, 13% did not describe any role, 5% were irrelevant to WPD and 2% were not professional. The highest proportion of professional roles was shared on Twitter. The proportion of photos, images, and tweets on pharmacist role on SM for WPD 2020-22 are shown in Figure 2. The largest and most important two categories identified in this study were drug distribution roles (40%) and patient care roles (35%).

Representative photos, images, and tweets posted for WPD 2020-22 links are provided in the supplementary material. Category A provides the images and photos highlighting the patient care roles of the pharmacist. We have observed the growing role of pharmacists in healthcare settings including the medication therapy expert, accessible healthcare provider, contributing member of the healthcare team, healthcare educator, and provider of pharmaceutical care. Category B illustrates the drug distribution roles (the pharmacists are standing in front of counters of medicines) on WPD 2020-22. The pharmacist is busy checking the doctor's prescription before dispensing the drug to the patient to make sure the patient is not receiving the wrong drug or taking the wrong dose. Category C facilitates the role of different pharmacists in different medical environments (prescribing, vaccination, treatment of chronic diseases, research, laboratory tests, etc.).

Note: All the links are available in the supplementary section for the further information.

## 5. Discussion

WPD and the International Pharmaceutical Federation (FIP) are significant entities that contribute to the recognition, promotion, and celebration of the pharmacy profession globally. These two aspects play a crucial role in highlighting

the importance of pharmacists' roles in healthcare and society and fostering professional development and collaboration. WPD is an annual event observed on September 25th, organized by the FIP in collaboration with various national pharmacy associations. The day serves as an opportunity to raise awareness about the vital role of pharmacists in healthcare delivery, patient safety, and public health. It also aims to recognize and appreciate the contributions of pharmacists to society and their commitment to improving patient outcomes [18]. As far as we know, no studies are using WPD SM-rated photos, images, and tweets that promote the pharmacy profession and pharmacist expanding and changing roles. In this study broad professional and diverse use of SM on WPD 2020-22 by people was observed. The highest weighted counts of posts were shared on Facebook because Facebook pages receive professional updates and information on their news feed on daily basis. Concerning Twitter usage, people heavily used it for professional purposes to receive, provide, and raise awareness about pharmacy services and expanding role of the pharmacist. The most popular topics were medication therapy expert, accessible healthcare provider, contributing member of the healthcare team, healthcare educator, provider of pharmaceutical care, researcher, and vaccinator and immunizer.

### 5.1. Professional Development Through SM

SM platforms provide with a wealth of resources and opportunities for professional development. Healthcare professionals and patients can access a wide range of educational content, including articles, research papers, webinars, and podcasts, which can enhance their knowledge and skills in various areas of pharmacy practice [19-21]. Additionally, many professional organizations and associations maintain active SM profiles, providing pharmacists with updates on the latest guidelines, clinical trials, and best practices. Furthermore, SM facilitates networking and collaboration [22]. Online communities, such as professional groups, forums, and virtual conferences, enable to connect with peers, engage in discussions, and exchange ideas. These interactions foster a sense of camaraderie and professional support, allowing learning from one another and gaining insights from diverse perspectives.

### 5.2. Advancement of Pharmacist Expanded Roles

SM platforms serve as powerful tools for advancing pharmacist expanded roles and promoting the value they bring to healthcare [23]. Pharmacists can leverage SM to advocate for policy changes that recognize and enhance their contributions to patient care. By actively participating in online discussions, sharing success stories, and promoting evidence-based practice, pharmacists can raise awareness about their expanded roles among policymakers, healthcare administrators, and the general public. Moreover, SM enables pharmacists to showcase their expertise and unique contributions. By creating professional profiles and sharing insights, pharmacists can

establish themselves as thought leaders in specific areas of pharmacy practice. This visibility can lead to exciting opportunities such as speaking engagements, collaborations with industry partners, and involvement in research projects, thereby further advancing their professional development and expanding their impact [24].

### 5.3. Presentation of Pharmacist Expanded Roles

SM provides pharmacists with a platform to effectively present their expanded roles to a broader audience, including fellow healthcare professionals, patients, and the public. Through compelling storytelling and the dissemination of educational content, pharmacists can educate the public about the valuable services they provide, such as medication therapy management, immunizations, chronic disease management, and medication safety. Furthermore, social media can be leveraged to address medication-related myths and misconceptions, providing evidence-based information to combat misinformation. By establishing themselves as reliable sources of information, pharmacists can contribute to improved health literacy and promote better medication use practices among patients [21].

This study had some limitations worth mentioning. There was no definitive way to confirm that an individual Facebook, Instagram, and Twitter user was a licensed/registered pharmacist based on the information available in his or her profile. Second, we did not consider the personal, cultural, and environmental factors. More studies are needed to evaluate how these factors affect peoples' perception of pharmacist modern pharmacy practices.

## 6. Conclusion

SM is becoming increasingly universal. SM sites and platforms have the capacity to foster individual and public health promotion, as well as facilitate professional development and advancement. The results of this study highlight the considerable potential of SM as a tool for health communication, education, and the delivery of health services. In terms of professional growth, leveraging diverse social media platforms presents an excellent opportunity to establish and broaden professional networks, share innovative ideas in pharmacy practice, and engage in ongoing professional development. Furthermore, SM can help in reshaping the pharmacy profession and enable pharmacists to make significant contributions to patient care in their expanded roles.

## Consent for Publication

All authors approved the manuscript.

## Competing Interests

All authors declare no competing interests.

## Author Contributions

Muhammad Ahmer Raza has generated the idea and discussed it with Shireen Aziz. Later on; Shireen Aziz provided the advice, conception, and design of the study. All other authors listed have made a substantial and intellectual contribution to the work and approved it for publication.

## Appendix

Supplementary material: Representative photos and images links posted for WPD 2020-22 on social media.

### Category A (Patient care)

[https://twitter.com/UHCW\\_Pharmacy/status/1175039009577492480](https://twitter.com/UHCW_Pharmacy/status/1175039009577492480)

<https://twitter.com/accpambuprn/status/1176823221158633472?lang=de>

<https://m.facebook.com/MaroofHospitalOfficial/photos/a.402110323203350/4324283864319290/>

### Category B (Drug distribution)

<https://m.facebook.com/GSKPharmaceuticalsIndia/photos/everyone-trusts-a-pharmacist-doctors-trust-them-to-understand-their-prescription/1475994039458451/>

<https://www.instagram.com/p/CFjouDtngE1/?igshid=YmMyMTA2M2Y%3D>

### Multiple roles (Category C)

<https://twitter.com/indiagovin/status/1044458809131843584>

[https://www.instagram.com/p/CUPOLc6l\\_GI/?igshid=YmMyMTA2M2Y%3D](https://www.instagram.com/p/CUPOLc6l_GI/?igshid=YmMyMTA2M2Y%3D)

<https://twitter.com/nhs/status/1176745371348996097>

## References

- [1] *Number of internet and social media users worldwide as of January 2023.*; Available from: <https://www.statista.com/statistics/617136/digital-population-worldwide/>.
- [2] Hajar, Z., K. A. Clauson, and R. J. Jacobs, *Analysis of pharmacists' use of Twitter*. American Journal of Health-System Pharmacy, 2014. 71 (8): p. 615-619.
- [3] Eysenbach, G. and C. Kohler. *What is the prevalence of health-related searches on the World Wide Web? Qualitative and quantitative analysis of search engine queries on the internet*. American Medical Informatics Association.
- [4] Bickart, B. and R. M. Schindler, *Special session summary expanding the scope of word of mouth: Consumer-to-consumer information on the internet*. ACR North American Advances, 2002.
- [5] Churchill, D., *Web 2.0 and possibilities for educational applications*. Educational Technology, 2007: p. 24-29.
- [6] *Facebook - Statistics & Facts.*; Available from: <https://www.statista.com/topics/751/facebook/#editorsPicks>.
- [7] *USA Today. Twitter overcounted active users since 2014.* [cited 2021 11 November]; Available from: <https://www.usatoday.com/story/tech/news/2017/10/26/twitter-overcounted-active-users-since-2014-shares-surge/801968001/>.

- [8] *Number of Instagram users worldwide.*; Available from: [statista.com/statistics/183585/instagram-number-of-global-users/](https://statista.com/statistics/183585/instagram-number-of-global-users/).
- [9] *Social Media Today. Instagram Stories is Now Being Used by 500 Million People Daily.* [cited 2021 11 November]; Available from: <https://www.socialmediatoday.com/news/instagram-stories-is-now-being-used-by-500-million-people-daily/547270/>.
- [10] McMullan, M., *Patients using the Internet to obtain health information: how this affects the patient–health professional relationship.* Patient education and counseling, 2006. 63 (1-2): p. 24-28.
- [11] Gardiner, R., *The transition from ‘informed patient’ care to ‘patient informed’ care.* Studies in health technology and informatics, 2008. 137 (5): p. 241-256.
- [12] Raza, M. A., et al., *Role of Pharmacist in Disaster Management: A Quantitative Content Analysis Approach.* INNOVATIONS in pharmacy, 2021. 12 (4).
- [13] Raza, M. A., et al., *Artificial Intelligence (AI) in Pharmacy: An Overview of Innovations.* Innov Pharm, 2022. 13 (2).
- [14] Ventola, C. L., *Social media and health care professionals: benefits, risks, and best practices.* Pharmacy and therapeutics, 2014. 39 (7): p. 491.
- [15] Given, L. M., *The Sage encyclopedia of qualitative research methods.* 2008: Sage publications.
- [16] O’Brien, B. C., et al., *Standards for reporting qualitative research: a synthesis of recommendations.* Academic medicine, 2014. 89 (9): p. 1245-1251.
- [17] *Delve Qualitative Analysis.* Available from: <https://delvetool.com/software>.
- [18] *FIP. World Pharmacist Day.*; Available from: <https://www.fip.org/world-pharmacistsday#:~:text=%E2%80%9CParmacy%3A%20AI ways%20trusted%20for%20your,Day%20on%2025%20September%202021>.
- [19] Kukreja, P., A. H. Sheehan, and J. Riggins, *Use of social media by pharmacy preceptors.* American journal of pharmaceutical education, 2011. 75 (9).
- [20] Brokowski, L. and A. H. Sheehan, *Evaluation of pharmacist use and perception of Wikipedia as a drug information resource.* Annals of Pharmacotherapy, 2009. 43 (11): p. 1912-1913.
- [21] Shcherbakova, N. and M. Shepherd, *Community pharmacists, Internet and social media: an empirical investigation.* Research in Social and Administrative Pharmacy, 2014. 10 (6): p. e75-e85.
- [22] Chou, W.-y. S., et al., *Social media use in the United States: implications for health communication.* Journal of medical Internet research, 2009. 11 (4): p. e1249.
- [23] Bennett, G. G. and R. E. Glasgow, *The delivery of public health interventions via the Internet: actualizing their potential.* Annual review of public health, 2009. 30: p. 273-292.
- [24] Moorhead, S. A., et al., *A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication.* Journal of medical Internet research, 2013. 15 (4): p. e1933.