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E-PROFESSIONALISM ASSESSMENT INSTRUMENTS IN HEALTHCARE PROFESSIONALS: A SYSTEMATIC REVIEW PROTOCOL

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Keywords:	Social Media, Medicine, eHealth, Nurses, Pharmacists

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1	E-PROFESSIONALISM ASSESSMENT INSTRUMENTS IN HEALTHCARE
2	PROFESSIONALS: A SYSTEMATIC REVIEW PROTOCOL
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17	ABSTRACT
18	Introduction: Social media has an impact on the reach and speed with which information
19	is disseminated, benefiting patients and healthcare professionals by sharing knowledge,
20	even from a distance. However, these channels can pose risks when used irresponsibly by
21	these actors. Thus, e-professionalism emerges as a modulator of professionals' behaviors
22	and attitudes, and its evaluation is fundamental given the demand for quality in services,
23	including in these settings. Thus, this study aims to identify instruments used to assess
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Methods and analysis: A systematic review will be developed to answer the question: "How is e-professionalism in healthcare professionals evaluated in the literature?". The searches will take place in the following databases: PUBMED/Medline, EMBASE, Web of Science, ERIC and Scopus using descriptors such as "professionalism", "e-professionalism", "social media" and synonyms. Studies will be selected after evaluating titles and abstracts, followed by analysis of full texts using the Rayyan tool. Studies that present the development and validation of e-professionalism assessment instruments for Nursing, Pharmacy, Medicine and Dentistry will be included. The quality of the instruments will be assessed based on evidence of content and construct validity reported by the developers.

Ethics and dissemination: This review is exempt from ethical approval because it does
not include patient data. The results of the systematic review will be disseminated through
a peer-reviewed journal and presented at a relevant conference.

38 Systematic review registration: PROSPERO REGISTRATION ID: CRD42023454825
39 Keywords: professionalism, e-professionalism, social media, instruments, nursing,
40 pharmacy, medicine, dentistry.

INTRODUCTION

In recent years, social media has had a great social impact, being essential in the daily lives of people who seek to share knowledge, access information and entertainment immediately. [1-3] Furthermore, the COVID-19 pandemic influenced this scenario by affecting the execution and delivery of services, requiring rapid transformation and adaptation on the part of providers, including health services. [4-6]

48 There are beneficial and relevant influencing factors in the use of social media by49 professionals and students in the health field, with an expansion of the possibilities for

50 interprofessional collaboration and exchange of knowledge, in addition to getting closer 51 to the patient despite the absence of physical contact. [7,8] Furthermore, health 52 professionals use social media to mitigate the "infodemic", a phenomenon that was 53 highlighted by the COVID-19 pandemic, characterized by the rapid dissemination of false 54 information, negatively impacting society. [9,10]

Despite its importance, there are risks associated with the way certain information is shared and the way professionals and students communicate in a virtual environment. [8] There is a common concern related to the use of social media in the healthcare sector: the impact on professionalism - as the use of public platforms, although potentially beneficial, can have professional implications if they are not used correctly. [11]

It is worth highlighting that professionalism is a process developed by professions as a strategy so that they can control their own work and be socially recognized. [12,13] In the scope of health, professionalism is still a set of ideologies that serves as the basis for the social contract between professionals and society. [4] Professionalism manifested through social media is called e-professionalism by Cain and Romanelli (2009). [14] The authors argue that in this scenario, attitudes and behaviors become public and are subject to different interpretations.[14] Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

According to Duke and collaborators (2017) [11], among the main components of e-professionalism is the ability to distinguish between appropriate and inappropriate conduct and the use of social media privacy settings. [11] Due to concerns about the risk of unprofessional behavior in the use of social media and established boundaries between professional relationships, several organizations have published guidelines for the appropriate use of these platforms. [8, 15, 16]

In view of the above, it is a great challenge to understand professionalism, and it
is possible to capture personal, interpersonal, and social dimensions [15]. Thus,

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75 investment in studies to understand e-professionalism assessment instruments can imply 76 the identification of gaps in assessment methods, the evolution of the construct in the 77 health area and the improvement of services provided by its professionals.

METHOD AND ANALYSIS

The objective of the study will be to identify instruments used to assess the eprofessionalism of healthcare professionals. To this end, a systematic review will be conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [17] guidelines, and this protocol was registered in PROSPERO -International prospective register of systematic reviews (ID CRD42023454825).

Search strategy

The answer to the question: "How is e-professionalism in healthcare professionals evaluated in the literature?" will be the focus of the review. To this end, a literature search will be carried out, consulting the PUBMED/Medline, EMBASE, Web of Science, ERIC, and Scopus databases with the following descriptors: "professionalism", "eprofessionalism", "social media", and their combinations and synonyms.

Study selection

From the search, articles will be selected following the following steps: exclusion of duplicate studies in the databases consulted, evaluation of titles and abstracts and, subsequently, analysis of full texts. The study selection stage will be carried out with the help of the Rayyan QRCI tool. [18] The process will be carried out by two researchers independently, and possible disagreements will be resolved by a third researcher, according to guidelines recommended in PRISMA.

Inclusion criteria

For the analysis of full texts, studies that meet the criteria will be included: (a)
studies that address the following health professions: Nursing, Pharmacy, Medicine, and

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Dentistry, (b) studies that have the e-professionalism of health professionals such as
central theme and (c) studies that present tools for evaluating the theme applied to
professionals, students in the health area or both simultaneously.

The e-professionalism assessment tools will be included based on the following categorization, proposed by the systematic review by Wilkinson and colleagues (2009): observed clinical encounter assessment, assessments by coworkers, records of incidents of unprofessionalism, report critical incident reports, simulations, patients' opinions, supervisors' opinions, tests based on problem situations and self-administered assessment. [19] The categories are described in Table 1. Other literature reviews, theses and dissertations, abstracts, letters to the editor and conference papers will not be included.

Table 1: Professionalism assessment categories

CATEGORY	DESCRIPTION
Observed Clinical Encounter Assessment	Carried out by observing a professional-patient interaction that is conducted in real patient care environments using real patients.
Assessments carried out by coworkers	This occurs through the collection of data and feedback on an individual's performance, acquired from various interested parties. Can be used to assess skills and behaviors that can sometimes be hidden within a formal environment
Records of unprofessionalism incidents	This is used on an "as needed" basis, whereby an observed incident of unprofessional behavior can be reported and collected centrally. An overview group would review the reports to determine if a pattern of behavior is apparent and/or if further action is needed.
Critical Incident Report	This method asks the professional to reflect on a critical incident that he or she has experienced or witnessed. Can encourage reflection and attention to elements of professionalism
Simulations	Scenarios that resemble real-life situations, but often use models or simulated patients. Simulations can be used to evaluate rare or unpredictable situations or to standardize the assessment of higher order communication skills
Patients' opinions	Obtained by collecting questionnaire-based patient opinions about the nominee's abilities in specific áreas
Supervisors' Opinion	This is a summary view made by a supervisor, reported on a form with predefined criteria. Criteria help define areas of importance, but their tendency to be used as the viewpoints of single observers at unique times can make them unreliable and difficult to defend.
Tests based on problem situations	This requires providing a scenario, such as an ethical dilemma or video meeting, and a series of questions to be answered. test

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Self-administered
assessmentIt consists of a questionnaire-based tool that an individual uses
to evaluate his or her personal attributes or attitudes. Can help
with reflection, but has limited use in summative assessments

because it cannot assess what a person does

112 Data extraction

111

For the studies included in the review, the following data will be extracted: author(s), year and language of publication, journal, country of origin, general objective and specific objectives of the study, profession, population (whether professionals or students of a certain profession), context and methodological design.[20] Data extraction will be carried out by two researchers independently, and a third researcher will be responsible for consensus. The extracted data will be arranged in Microsoft Excel® spreadsheets.

120

Assessment of the quality of tools

121 The quality of the tools will be assessed using the Consensus-based Standards for 122 the Selection of Health Status Measurement Instruments (COSMIN) checklist, developed 123 to evaluate, in a valid and reliable way, the methodological quality of tools that measure 124 multidimensional and not directly measurable constructs.[21]

The COSMIN checklist contains nine boxes for evaluating measurement properties: internal consistency (A), reliability (B), measurement error (C), content validity (D), structural validity (E), hypothesis testing (F), cross-cultural validity (G), criterion validity (H), and responsiveness (I), and a box contains standards for interpretability studies (J). These boxes contain five to 18 items that cover the reliability, validity, and responsiveness domains.

Each item will be answered using a scoring system proposed by Terwee and collaborators (2012), which consists of a four-point scale (excellent, good, fair or bad),

and the methodological quality of the box will be classified by the worst evaluation among the items.[21,22] Therefore, if in a box there is a single item considered "bad", the methodological quality of the measurement property evaluated in the box is classified in this way. This step will be independently carried out by two researchers. To reduce the risk of bias, specific quality criteria will be adopted for each item on the COSMIN checklist. [21]

ETHICS AND DISSEMINATION:

140 This review is exempt from ethical approval because it does not include patient 141 data. The results of the systematic review will be disseminated through a peer-reviewed 142 journal and presented at a relevant conference.

DISCUSSION

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In this scoping review, e-professionalism assessment instruments for Nursing, Pharmacy, Medicine, and Dentistry will be identified. By synthesizing this evidence, we hope to contribute to the understanding of how professionalism has been characterized in virtual settings. This understanding is fundamental given the impact of social media and the need for health professionals to adapt to these changes.

In view of this, it is expected to provide insights from the assessment of the quality of the identified instruments to report the effectiveness and usability of effective tools for health professionals. Finally, this study can serve as a basis for future investigations, inspiring additional research in the field of e-professionalism by providing information that empowers students and professionals to face the challenges of the digital world with ethics and competence.

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39 Keywords: professionalism, e-professionalism, social media, instruments, nursing,
40 pharmacy, medicine, dentistry.

- 42 Strengths and limitations of this study
 - The study presents a relevant and timely topic that has been generating growing interest among professionals and researchers.
 - This study has the potential to encourage the production of new research on eprofessionalism in the healthcare field.
 - This protocol does not cover all healthcare professions, which may limit the comprehensiveness and generalizability of the results.

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49 **INTRODUCTION** 50 Social media refers to Web 2.0 digital platforms that integrate personal and mass 51 communication, enabling content creation, information sharing, and user interaction. 52 These platforms can be categorized into different types, such as communication tools 53 (e.g., WhatsApp, Telegram) and social networks (e.g., Instagram, Facebook) [1, 2]. They 54 differ from Web 1.0 platforms, such as email and text messaging, by offering a more 55 dynamic and interactive experience, in contrast to the linear content distribution 56 characteristic of earlier digital communication média. [2] 57 58 In recent years, social media has had a great social impact, being essential in the 59 daily lives of people who seek to share knowledge, access information and entertainment 60 immediately. [3-5] Furthermore, the COVID-19 pandemic influenced this scenario by 61 affecting the execution and delivery of services, requiring rapid transformation and 62 adaptation on the part of providers, including health services. [6-8] 63 There are beneficial and relevant influencing factors in the use of social media by 64 professionals and students in the health field, with an expansion of the possibilities for 65 interprofessional collaboration and exchange of knowledge, in addition to getting closer 66 to the patient despite the absence of physical contact. [9,10] Furthermore, health 67 professionals use social media to mitigate the "infodemic", a phenomenon that was highlighted by the COVID-19 pandemic, characterized by the rapid dissemination of false 68 69 information, negatively impacting society. [11,12]

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Despite its importance, there are risks associated with the way certain information
is shared and the way professionals and students communicate in a virtual environment.
[8] There is a common concern related to the use of social media in the healthcare sector:

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the impact on professionalism - as the use of public platforms, although potentially
beneficial, can have professional implications if they are not used correctly. [13]

It is worth highlighting that professionalism is a process developed by professions as a strategy so that they can control their own work and be socially recognized. [14,15] In the scope of health, professionalism is still a set of ideologies that serves as the basis for the social contract between professionals and society. [6] Professionalism manifested through social media is called e-professionalism by Cain and Romanelli (2009). [16] The authors argue that in this scenario, attitudes and behaviors become public and are subject to different interpretations.[16]

According to Duke and collaborators (2017) [13], among the main components of e-professionalism is the ability to distinguish between appropriate and inappropriate conduct and the use of social media privacy settings. [13] Due to concerns about the risk of unprofessional behavior in the use of social media and established boundaries between professional relationships, several organizations have published guidelines for the appropriate use of these platforms. [10, 17, 18]

In view of the above, it is a great challenge to understand professionalism, and it is possible to capture personal, interpersonal, and social dimensions [17]. Thus, investment in studies to understand e-professionalism assessment instruments can imply the identification of gaps in assessment methods, the evolution of the construct in the health area and the improvement of services provided by its professionals.

METHOD AND ANALYSIS

The objective of the study will be to identify instruments used to assess the eprofessionalism of healthcare professionals. To this end, a systematic review will be conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-

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97 Analyses (PRISMA) [19] guidelines, and this protocol was registered in PROSPERO -98 International prospective register of systematic reviews (ID CRD42023454825). 99 Search strategy 100 The answer to the question: "How is e-professionalism in healthcare professionals

101 evaluated in the literature?" will be the focus of the review. To this end, a literature search 102 will be carried out, consulting the PUBMED/Medline, EMBASE, Web of Science, ERIC, 103 and Scopus databases with the following descriptors: "professionalism", 104 professionalism", "social media", and their combinations and synonyms.

105 A detailed draft of the search strategy proposed for this study can be found in the 106 supplementary file.

Study selection

108 From the search, articles will be selected following the following steps: exclusion 109 of duplicate studies in the databases consulted, evaluation of titles and abstracts and, 110 subsequently, analysis of full texts. The study selection stage will be carried out with the 111 help of the Rayyan QRCI tool. [20] The process will be carried out by two researchers 112 independently, and possible disagreements will be resolved by a third researcher, 113 according to guidelines recommended in PRISMA.

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Inclusion criteria

115 For the analysis of full texts, studies that meet the criteria will be included: (a) 116 studies that address the following health professions: Nursing, Pharmacy, Medicine, and 117 Dentistry, (b) studies that have the e-professionalism of health professionals such as 118 central theme and (c) studies that present tools for evaluating the theme applied to 119 professionals, students in the health area or both simultaneously. No language or 120 publication period restrictions will be applied to this systematic review.

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The e-professionalism assessment tools will be included based on the following categorization, proposed by the systematic review by Wilkinson and colleagues (2009): observed clinical encounter assessment, assessments by coworkers, records of incidents of unprofessionalism, report critical incident reports, simulations, patients' opinions, supervisors' opinions, tests based on problem situations and self-administered assessment. [21] The categories are described in Table 1. Other literature reviews, theses and dissertations, abstracts, letters to the editor and conference papers will not be included.

Table 1: Professionalism assessment categories

CATEGORY	DESCRIPTION
Observed Clinical Encounter Assessment	Carried out by observing a professional-patient interaction that is conducted in real patient care environments using real patients.
Assessments carried out by coworkers	This occurs through the collection of data and feedback on an individual's performance, acquired from various interested parties. Can be used to assess skills and behaviors that can sometimes be hidden within a formal environment
Records of unprofessionalism incidents	This is used on an "as needed" basis, whereby an observed incident of unprofessional behavior can be reported and collected centrally. An overview group would review the reports to determine if a pattern of behavior is apparent and/or if further action is needed.
Critical Incident Report	This method asks the professional to reflect on a critical incident that he or she has experienced or witnessed. Can encourage reflection and attention to elements of professionalism
Simulations	Scenarios that resemble real-life situations, but often use models or simulated patients. Simulations can be used to evaluate rare or unpredictable situations or to standardize the assessment of higher order communication skills
Patients' opinions	Obtained by collecting questionnaire-based patient opinions about the nominee's abilities in specific áreas
Supervisors' Opinion	This is a summary view made by a supervisor, reported on a form with predefined criteria. Criteria help define areas of importance, but their tendency to be used as the viewpoints of single observers at unique times can make them unreliable and difficult to defend.
Tests based on problem situations	This requires providing a scenario, such as an ethical dilemma or video meeting, and a series of questions to be answered. test underlying knowledge of some principles of professionalism, moral reasoning, or decision-making
Self-administered assessment	It consists of a questionnaire-based tool that an individual uses to evaluate his or her personal attributes or attitudes. Can help with reflection, but has limited use in summative assessments because it cannot assess what a person does

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Data extraction

For the studies included in the review, the following data will be extracted: author(s), year and language of publication, journal, country of origin, general objective and specific objectives of the study, profession, population (whether professionals or students of a certain profession), context and methodological design. [22] Data extraction will be carried out by two researchers independently, and a third researcher will be responsible for consensus. The extracted data will be arranged in Microsoft Excel® spreadsheets.

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Assessment of the quality of tools

The quality of the tools will be assessed using the Consensus-based Standards for the Selection of Health Status Measurement Instruments (COSMIN) checklist, developed to evaluate, in a valid and reliable way, the methodological quality of tools that measure multidimensional and not directly measurable constructs [23]. Enseignement Superieur (ABES) Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies

143 The COSMIN checklist contains nine boxes for evaluating measurement 144 properties: internal consistency (A), reliability (B), measurement error (C), content 145 validity (D), structural validity (E), hypothesis testing (F), cross-cultural validity (G), 146 criterion validity (H), and responsiveness (I), and a box contains standards for 147 interpretability studies (J). These boxes contain five to 18 items that cover the reliability, 148 validity, and responsiveness domains.

Each item will be answered using a scoring system proposed by Terwee and collaborators (2012), which consists of a four-point scale (excellent, good, fair or bad), and the methodological quality of the box will be classified by the worst evaluation among the items.[23, 24] Therefore, if in a box there is a single item considered "bad", the methodological quality of the measurement property evaluated in the box is classified in this way. This step will be independently carried out by two researchers. To reduce the

- 3 4	155	risk of bias, specific quality criteria will be adopted for each item on the COSMIN
5 6	156	checklist. [23]
7 8	157	Patient and Public Involvement
9 10 11	158	None
12 13	159	ETHICS AND DISSEMINATION:
14 15 16	160	This review is exempt from ethical approval because it does not include patient
16 17 18	161	data. The results of the systematic review will be disseminated through a peer-reviewed
19 20	162	journal and presented at a relevant conference.
21 22		
23	163	DISCUSSION
24 25		
26	164	In this scoping review, e-professionalism assessment instruments for Nursing,
27 28 20	165	Pharmacy, Medicine, and Dentistry will be identified. These professions were selected
29 30 31	166	for this study due to their longstanding tradition in the development of health sciences.
32 33	167	Furthermore, these are the health-related professions with the highest number of
34 35	168	registered professionals, highlighting their extensive integration and significant impact
36 37 38	169	on healthcare systems [25] (WHO - World Health Organization, 2024).
39 40	170	By synthesizing this evidence, we hope to contribute to the understanding of how
41 42	171	professionalism has been characterized in virtual settings. This understanding is
43 44	172	fundamental given the impact of social media and the need for health professionals to
45 46 47	173	adapt to these changes.
48 49	174	In view of this, it is expected to provide insights from the assessment of the quality
50 51	175	of the identified instruments to report the effectiveness and usability of effective tools for
52 53 54	176	health professionals. Finally, this study can serve as a basis for future investigations,
55 56	177	inspiring additional research in the field of e-professionalism by providing information
57 58	178	that empowers students and professionals to face the challenges of the digital world with
59 60	179	ethics and competence.

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9 10 11	279	Declarations:
12 13	280	Ethics approval and consent to participate: not applicable
14 15 16	281	Consent for publication: not applicable.
17 18	282	Availability of data and materials: Datasets used and/or analyzed during the current
19 20	283	study made available by the corresponding author upon request.
21 22 23	284	Competing interests: The author(s) declare(s) that there are no conflicts of interest.
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28 29 30	287	Author contributions: FCAN, LGS, TMAT, DMS, and DPLJ participated in the study
31 32	288	conception and design. FCAN, LGS, TMAT, and DMS drafted the article. FCAN and
33 34	289	DPLJ revised the manuscript critically for important intellectual content. DPLJ are the
35 36	290	guarantor.
37 38 39	291	All authors accepted the final version of the manuscript.
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SEARCH STRATEGY – SCOPING REVIEW – PROFESSIONALISM IN SOCIAL MEDIA

	DRAFT OF SEARCH STRATEGY
Database	ALL=("Social Media" OR "Internet" OR "Internet Use" OR "Internet of Things" OR "Media
	Social" OR "Social Medium" OR "Web 2.0" OR "World Wide Web" OR "Cyberspace" OR "Cybe
	Space" OR "Internet Uses" OR "Use, Internet" OR "Web Usage" OR "Usage, web" OR "Web Use
Web of Science	OR "Use, Web" OR "Internet Usage" OR "Usage, Internet")
web of Selence	AND
	ALL= ("Professionalism" OR "Online professionalism" OR "Digital professionalism" OR "E
	professionalism")
	((((((((((((((((("Social Media"[MeSH Terms]) OR ("Social Media")) OR ("Internet"[MeSH
	Terms])) OR ("Internet")) OR ("Internet Use")) OR ("Internet of Things")) OR ("Internet of
	Things"[MeSH Terms])) OR ("Internet Use"[MeSH Terms])) OR ("Media, Social")) OR ("Socia
	Medium")) OR ("Web 2.0")) OR ("World Wide Web")) OR ("Cyberspace")) OR ("Cyber Space")
PubMed/Medline	OR ("Internet Uses")) OR ("Use, Internet")) OR ("Web Usage")) OR ("Usage, Web")) OR ("Web Usage")) OR
	Use")) OR ("Use, Web")) OR ("Internet Usage")) OR ("Usage, Internet") AND
	(((("Professionalism"[MeSH Terms]) OR ("Professionalism")) OR ("Online professionalism") OR ("Digital professionalism")) OR ("E-professionalism")
	OK (Digital processionalism)) OK (D-processionalism)
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