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Abstract:

This study presents a ranking list of 35 management- and 28 clinical-centered e-health academic journals developed based on a survey of 398 active researchers from 46 countries. Among the management-centered journals, the researchers ranked *Journal of the American Medical Informatics Association* and *Journal of Medical Internet Research* as A+ journals; among the clinical-focused journals, they ranked *BMC Medical Informatics and Decision Making* and *IEEE Journal of Biomedical and Health Informatics* as A+ journals. We found that journal longevity (years in print) had an effect on ranking scores such that longer standing journals had an advantage over their more recent counterparts, but this effect was only moderately significant and did not guarantee a favorable ranking position. Various stakeholders may use this list to advance the state of the e-health discipline. There are both similarities and differences between the present ranking and the one developed earlier in 2010.

Keywords: Journal Ranking, E-health, Health IT, Health Informatics, Expert Survey, Longevity.

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1 Introduction

Even in its early years, electronic health (e-health) has already attracted the attention of thousands of scholars from all over the world. Despite its brief history, it already exhibits the attributes of an academic discipline (Messer-Davidow, Shumway, & Sylvan, 1993): it has its own set of artifacts, phenomena, and inquiry methods; it produces dedicated scholars and practitioners; it defines its unique infrastructure required for functioning, such as resources, facilities, and financial support; it has a positive impact on stakeholders' wellbeing; and it generates an exclusive body of knowledge published in its own journals. The present study focuses on the last attribute of the e-health discipline: its academic journals.

Inquiry into the nature of academic journals has always persisted in all scientific domains (Ferratt, Gorman, Kanet, & Salisbury, 2007; Menachemi, Hogan, DelliFraine, & Flaks, 2015; Saarela, Kärkkäinen, Lahtonen, & Rossi, 2016). Particularly, we need to understand the nature of journals in recently founded disciplines because journals contain the disciplines' body of knowledge, influence their identity, and even set their future directions. One way to understand the nature of a discipline's journals is through developing ranking lists because they reflect a cumulative opinion of active researchers about the value of journals they read and in which they publish their works. Le Rouge and De Leo (2010) developed a ranking list of 44 e-health journals in their pioneering and worthwhile attempt to better understand the e-health discipline. The present study builds on and extends their work by creating a comprehensive ranking list of 63 (35 management-centered and 28 clinical-centered) e-health journals.

We conducted this study for several reasons. First, because e-health is a new and growing discipline, one can expect new e-health journals to appear every year, and adding them to the ranking list is critical in order to inform the research community about their very existence and relative standing. Second, Le Rouge and De Leo (2010) developed a single ranking list by combining both management-focused and clinical-focused outlets. However, two interacting yet different areas (one concerning management IT-related issues and another pertaining to clinical topics) represent the e-health domain (Oh, Rizo, Enkin, & Jadad, 2005). Recently, Menachemi et al. (2015) empirically demonstrated that researchers from different healthcare subdisciplines rank healthcare journals differently and that similar behavior may exist in the e-health domain. Thus, we need two distinct ranking lists to ensure that survey respondents "compare apples to apples". Third, since 2010, some journals may have stopped printing (e.g., *Informatics Review*), merged with others, changed their titles (e.g., *IEEE Transactions on Information Technology in Biomedicine*), or changed their focus (e.g., by focusing more on engineering, physics, or pure medicine), which a current ranking list should reflect. Fourth, active researchers may gradually alter their perceptions of journals' quality. Fifth, the population of active e-health researchers may change because new scholars join the discipline and others exit it (e.g., due to retirement). Sixth, whereas Le Rouge and De Leo employed a rigorous survey method, they presented the journals being ranked in alphabetical order. However, due to the presence of order-effect bias in journal ranking surveys (Serenko & Bontis, 2013a), researchers recommend randomizing the order of journals for each survey participant. Seventh, Le Rouge and De Leo selected survey respondents from academic departments whose research interests pertained to e-health and used a snowballing technique. However, this approach did not ensure that each journal being ranked was equally represented by the same number of authors who published in it, which might have introduced bias. Eighth, Le Rouge and De Leo's list also contains pure practitioner journals (e.g., *Linux Medical News*), which are difficult to rank against academic ones. With that said, we do not criticize or diminish the merit of previous research; instead, we continue this line of research in order to advance the e-health discipline.

The rest of this paper proceeds as follows. In Section 2, we discuss the role of academic journals, review the e-health discipline, and justify the value of journal rankings. In Section 3, we present the methodology we followed. In Section 4, we present our findings. Finally, in Section 5, we discuss our observations, offer advice on properly using the developed ranking, and conclude the paper.

2 Theoretical Background

2.1 Academic Journals

Since the late 19th century, the advancement of knowledge through engagement in various research activities has become a long-standing tradition of higher education institutions around the globe, and the demonstration of research productivity and impact has been considered a key evaluation criterion for university faculty, especially at research-intensive schools (Boyer, Moser, & Ream, & Braxton, 2016). As a result, scholars have continuously contributed to the constantly growing body of knowledge (Price, 1961) that they must deliver to various stakeholders. Of the many knowledge dissemination channels that have been introduced, academic journals occupy perhaps a leading position. The first academic journal, *Philosophical Transactions of the Royal Society*, began in the 17th century (Oldenburg, 1665), and, by the end of 2016, over 70,000 active peer-reviewed academic journals were listed in the Ulrich's Global Serials Directory. Out of these, 60,000 journals were published in English, commonly referred to as "the language of science" (Ammon, 2001).

Academic journals perform several important functions to advance scientific thinking (Davis, 2014; Hardré & Mortensen, 2014; Weiner, 2001). First, they convene communities of scholars who share passion and thirst for knowledge in a particular area of inquiry in a way other endeavors cannot. They unite like-minded peers and bring coherence to disciplines. Second, through the (somewhat imperfect) peer-review system (Starbuck, 2016), academic journals (generally) help authors improve their work by identifying a manuscript's weaknesses and proposing solutions (Starbuck, 2003). The peer-review process also "certifies" the quality, rigor, and value of work and suggests that reading it likely has worth. Third, journals impose acceptable publication formatting requirements, which standardizes the appearance of published works and makes them easier to read. Fourth, academic journals establish authorship to ensure authors receive credit for their effort and assign intellectual property rights to the publisher that promotes published works. Fifth, journals accumulate works that represent evidence of scientific productivity in a discipline, disseminate knowledge in the academic and (occasionally) practitioner communities, and preserve the accumulated learnings for the future generations of scholars. Sixth, influential scientists, who often serve as journal editors, board members, and reviewers, exercise their power to determine and promote particular topics, views, and methods. Seventh, journals signify the very existence of a scientific domain, niche discipline, or school of thought (Nie, Ma, & Nakamori, 2009). Eighth, publication records in the form of journal papers inform hiring, tenure, promotion, salary, and funding decisions (Chen et al., 2015), which may be a very controversial yet frequent function of contemporary academic journals. Overall, despite some limitations of the model that underlies the operation of academic journals, most readers agree that their contribution to the scientific progress is virtually undeniable.

Academic journals also dramatically differ from other knowledge dissemination channels. Academic journals represent a community of dedicated scholars, whereas conferences generally function as a "social club" to bring like-minded scholars together. Conference proceedings are often used to spot new trends and gain ideas, but they are rarely extensively relied on and cited[1]. Conference papers are usually short and are written to solicit feedback from conference reviewers and attendees to extend them further into full-length journal papers. Scholarly books and textbooks, targeted at other academics and students, respectively, incorporate knowledge from hundreds of academic papers and often serve as extensive reviews of a discipline (Serenko, Bontis, & Hull, 2011; Serenko, Bontis, & Moshonsky, 2012). They also undergo a different review process, and their weight in terms of tenure and promotion decisions varies across institutions, whereas the value of journal papers is generally uniform. Contributions to books, such as book and encyclopedia chapters, often rely on previous authors' works and rarely report new empirical studies. Academic journals are published at regular intervals, whereas publications of books and book chapters are typically limited to a single production cycle unless one can justify later editions. Practitioner (non-peer-reviewed) magazines contain short, prescriptive articles and case studies based on the authors' previous experience rather than on a rigorous scientific process of inquiry.

Overall, academic journals play a crucial role in all scientific disciplines. Their impact, however, is more significant in newly formed and niche areas because academic journals can exert tremendous influence on the development of novel scientific areas and easily manipulate smaller-size academic domains. E-health is a relatively new discipline that already has its own discipline-centric peer-reviewed outlets (Le Rouge & De Leo, 2010). Thus, it behooves one to continue a never-ending inquiry into the nature of e-health academic journals.

2.2 The E-health Discipline

E-health is "the cost-effective and secure use of information and communications technologies in support of health and health-related fields" (WHO, 2005, p. 121). Researchers often use e-health as an umbrella term that includes both health informatics (Weigel, Rainer, Hazen, Cegielski, & Ford, 2013) and health IT

[1] In some disciplines (e.g., computer science), conference proceedings play a more important role than academic journals do, but these cases are exceptions.

(Cousins, 2016). Before the e-health term emerged around 1999 (Eysenbach, 2001), researchers in other disciplines (such as information systems, artificial intelligence, information economics, and dynamic systems) had already explored related ideas, approaches, and technologies (Della Mea, 2001). As an interdisciplinary discipline, e-health adapts theories, methods, and applications of emerging technologies developed in behavioral, medical, biomedical, and information sciences to the context of information technologies (Atienza et al., 2007; Ückert et al., 2014). It empowers patients by delivering personalized patient-centered care (Wilson, Wang, & Sheetz, 2014) and offering evidence-based choice (Eysenbach & Diepgen, 2001). Today, vast educational curricula exist and continue to evolve in the form of individual courses and post-secondary programs that pertain to the entire spectrum of the e-health discipline (Kampov-Polevoi & Hemminger, 2011).

In the mid-2000s, a relatively new yet promising concept of e-health 2.0 gained momentum. This approach involves using Web 2.0 technologies (e.g., social networking sites, wikis, portals, online communities, collaborative tagging, videos, user-generated content, self-publishing) and mobile devices and cloud computing to create new opportunities for patient empowerment, openness, and collaboration (Eysenbach, 2008; Van De Belt, Engelen, Berben, & Schoonhoven, 2010). E-health focuses on delivering communication and collaboration platforms for both health professionals and health consumers to facilitate health provider ratings, discussion boards, ask-a-doctor services, medicine ratings, data-driven decision making, and search personalization (Kordzadeh & Warren, 2013). E-health networks may "remove time and distance barriers to the flow of health information and can therefore help to ensure that collective knowledge is brought to bear effectively on health problems throughout the world" (Mukherjee & McGinnis, 2007, p. 350). Whereas it is too early to judge a potential evolution and widespread adoption of e-health 2.0 technologies, it is unarguable that proper implementation of e-health solutions may generate substantial medical cost savings, improve health operational efficiency, take the physician-patient relationship to a whole new level, promote self-care services, increase patients' satisfaction, and reduce laborious health systems-related administrative tasks.

Notably, e-health is not a homogeneous discipline. It comprises two interacting yet somewhat distinct subareas: one focuses on management IT-related issues and the other concentrates on clinical ones (Oh et al., 2005). The focus on management-related IT issues pertains to topics traditionally studied in information systems (e.g., end user system acceptance), information technology (e.g., system development), electronic commerce/business (e.g., online procurement of products and services), consumer marketing (e.g., online promotion of wellness services), organizational management (e.g., electronically administering employee health benefits) (Mukherjee & McGinnis, 2007), and knowledge management (e.g., implementation of virtual communities of practice) (Winkelman & Choo, 2003). The concentration on clinical-centered issues concerns biomechanical, biomedical, information methods in medicine, health topics, and specialized clinical informatics that involve the use of IT (e.g., the application of IT in digital imaging, primary care, dentistry, pharmaceuticals, and nursing) (Hersh, 2009). In a similar vein, Le Rouge and De Leo (2010) report that 54 and 46 percent of e-health researchers specialize in a management (e.g., information systems, organizational behavior, strategy) or clinical (e.g., medicine, nursing, public health) area. Thus, e-health journals try to specialize by catering to either category of readers.

Since its inception, the e-health domain has drawn the attention of academics and practitioners all over the world (Hesse & Shneiderman, 2007; Pagliari et al., 2005). As a result, the volume of e-health work has continuously grown, and new scholarly journals have continuously arisen (Jiang, Wang, Peng, & Zhu, 2015). At the same time, e-health scientific output is unequally distributed among countries: some have experienced a decline in their volume of e-health research (Polašek & Kern, 2012). The discipline also suffers from a high degree of over-differentiation, and many researchers who pursue e-health topics fail to realize they are working in the e-health domain. It also lacks clear identity and recognition in the broader scientific community. There are tensions among e-health researchers (e.g., see Hughes, Joshi, & Wareham, 2008), and e-health stakeholders have called for a better unification of the discipline (Ahern, Kreslake, & Phalen, 2006). Wilson, Balkan, and Lankton (2014) also propose reconsidering current research practices and focusing on validity.

Even so, the aforementioned issues do not threaten the legitimacy and future development of e-health as an independent discipline. It currently resides in the pre-science stage, which represents an initial phase of a scientific discipline's evolution when it experiences constant debate, lack of consensus, contradictory theories, and competing schools of thought (Kuhn, 1962, 1977). Eventually, most disciplines progress to the state of normal science accompanied by the establishment of generally accepted paradigms, unity, and agreement. It is, however, important to help the discipline transition to this normal state, which one may achieve by uniting researchers and helping them realize the identity of their chosen research area. To do so, one can inquire into the nature of the discipline's academic journals, which are an irrevocable attribute of its identity.

2.3 Academic Journal Rankings

Academic papers represent the currency circulating in the "prestige economy" (Blackmore & Kandiko, 2011) where academics engage in (hopefully) healthy competition to place their works in the best quality outlets to give them more exposure and receive proper credit for their intellectual contributions. It is a well-accepted fact that journals differ in terms of their quality and impact on academic disciplines, and researchers, therefore, wish to know their relative standing. To obtain this standing, they tend to consult journal ranking lists that are regularly published in most, if not all, scientific disciplines. Regrettably, few have attempted to rank journals in the e-health domain. In addition to Le Rouge and De Leo's (2010) pioneering study, SCImago[2] maintains such a list and uses several forms of citation impact measures. However, this ranking focuses on only health informatics journals and includes only a limited set of outlets. As e-health continues to emerge as a research focus for many academics, so grows the importance of its journal rankings.

Having a comprehensive e-health journal ranking list based on a well-established empirical method is important for several reasons. First, it signifies the very existence of the e-health discipline and informs researchers in other disciplines about e-health's main body of knowledge. Second, it brings unity to the domain by demonstrating a certain level of consensus on the quality of e-health journals because it reflects an opinion of active e-health researchers about the relative standing of each outlet. Third, it informs researchers' manuscript submission decisions. Fourth, novice e-health researchers may consult the ranking list to identify the most relevant and reputable journals that they might add to their "reading lists". Fifth, applicants for jobs, tenure and promotion, and salary increases may use the ranking list to justify the legitimacy of their research discipline and defend the quality of their research output. Sixth, e-health academics may present the ranking list to their university libraries in order to ensure they subscribe to their preferred journals. Seventh, having a well-recognized journal ranking based on a valid empirical method is especially critical at a pre-science stage of the development of e-health as a scientific discipline because it may help advance its identity and ensure its progress to the stage of normal science.

E-health is a highly distinct, niche discipline that has its own group of dedicated scholars who read each other's works and contribute to the common body of knowledge that appears in e-health-centric journals. Thus, one may consider e-health-centric journals specialist journals because they focus on a relatively small set of e-health-related phenomena and cater to a homogeneous category of scholars. Unfortunately, specialist journals rarely appear in comprehensive and general journal rankings, which include outlets from a variety of domains. When included, they are dramatically disadvantaged and do not fare well (Sangster, 2015). For example, accounting history and accounting education domains are (unfairly) poorly ranked in the Chartered Association of Business Schools' (ABS) Academic Journal Guide of the UK (Sangster, 2011). Out of 27 knowledge management and intellectual capital-centric peer-reviewed journals (Serenko & Bontis, 2013b; Serenko & Bontis, 2017), few have been included in the French ranking of management journals developed by the French Foundation for Management Education (Fondation Nationale pour l'Enseignement de la Gestion des Entreprises). Moreover, the *Journal of Knowledge Management*, the premier journal in the knowledge management discipline with an acceptance rate of around 10 percent, is ranked "2—acceptable standard" out of 5 (with 4* being the highest) in the ABS ranking. Researchers have observed similar cases in many niche disciplines. For example, in 2005, there were 40 journals devoted to hospitality and tourism, but no discipline-specific journal ranking existed, which worked against the interest of the discipline's stakeholders (McKercher, 2005). Fortunately, a call to resolve this gap was quickly answered, which benefitted the entire research community (Gursoy & Sandstrom, 2016; McKercher, Law, & Lam, 2006).

In comprehensive journal ranking studies that include journals from various disciplines (e.g., general business journal rankings), the "one-size-fits-all" ranking approach fails the specialist journals (Milne, 2000; Mingers & Willmott, 2013). The key issue with these types of rankings stems from a smaller size of the research community that works in a highly specialized, niche area. This issue affects rankings constructed with either of the two most common methods: those that involve expert surveys and those

[2] See http://www.scimagojr.com/journalrank.php?category=2718

that rely on journal citation impact measures in various ways. Expert survey rankings involve experts' (e.g., active researchers) assigning rankings through a survey-based approach. Specialist journals may be included in a comprehensive list of journals, yet most of the journals on the list cater to a more general readership. As a result, few survey respondents may be interested in the topics that the specialist journals focus on or be familiar with such outlets. This situation would result in the experts' scoring these journals lower, which undermines their position relative to the other more general journals that cater to a wider readership. Journal citation impact measure-based rankings use indices that count (in various ways) the number of citations received by the papers in that journal. The number of citations that each paper receives depends on the overall number of scholars interested in the topic. Again, because a smaller community of researchers reads specialist journals, one can expect the overall number of their citations per paper to be lower than that of more general journals. As a result, specialist journals obtain lower citation scores, which negatively affects their ranking position.

As such, the only way to avoid the pitfalls of comprehensive journal rankings is to design exclusive rankings of specialist journals in each niche discipline, which researchers have frequently done in many domains. Examples include business and technical communication (Lowry, Humphreys, Malwitz, & Nix, 2007a), business ethics (Beets, Lewis, & Brower, 2016; Serenko & Bontis, 2009a), library & information science (Manzari, 2013), artificial intelligence (Rokach, 2012; Serenko, 2010), information systems (Chen et al., forthcoming), and knowledge management (Serenko & Bontis, 2009b). With this study, we further advance the pioneering attempt by Le Rouge and De Leo (2010) to understand researchers' perceptions of e-health journals. We develop a ranking list based on a rigorous and well-accepted method that has been commonly employed in scientometrics.

3 Methodology

In this study, we developed a ranking list based on surveying active e-health researchers. Researchers have also referred to this method as an expert survey or stated preference approach. It is a popular method that researchers in many disciplines have frequently used (Lowry, Karuga, & Richardson, 2007b; Rousseau, 2008). We selected it over a citation-based ranking technique (i.e., revealed preference approach) for several reasons. First, citation data are extremely skewed when a minority of all papers and journals generate a disproportionate number of citations (Seglen, 1992), which disadvantages some ranked journals. Second, editors and publishers often manipulate citation data by using both acceptable and questionable practices (e.g., self-citations or forced citations) (Bjørn-Andersen & Sarker, 2009; Rousseau, 1999; Sevinc, 2004; Straub & Anderson, 2009). In extreme cases, self-citations represent up to 85 percent of all received citations (Monastersky, 2005). Third, the confounding impact of a journal's longevity (years in print) is more significant when one constructs a ranking list based on citation measures than when one creates a ranking list based on the results of expert scores (Serenko & Dohan, 2011). Particularly, recently launched journals are dramatically disadvantaged because it takes many years to accumulate citations. Because many e-health journals launched less than a decade ago, they may receive fewer citations than their older counterparts and, therefore, may receive unfairly low scores. Fourth, citation-based ranking lists assume all citations to have the same weight, whereas the weight of every citation differs in terms of its contribution (e.g., referencing a basic example in the introduction section compared to referencing a major theory on which the study is founded). Fifth, citation measures are more stable over time than expert scores because a paper simply may not be "uncited", whereas opinions of a journal can potentially diminish. E-health is a very dynamic discipline characterized by the introduction of new topics, paradigms, and research methods, which requires one to use a robust ranking method to rank its journals.

We developed a list of journals to rank via comprehensively searching the Ulrich's Periodicals Directory, the SCImago Journal and Country Rank (SCImago) Portal (available at http://www.scimagojr.com), major journal publishers, and Google Scholar. To be included in the list, each journal had to meet the following criteria:

1. Be peer reviewed
2. Concentrate on various aspects of e-health, including health informatics and health IT
3. Be currently in print
4. Be published in English, and

5. Be excluded from the Beall's List of predatory publishers and journals (which was still available at the date of this study at http://scholarlyoa.com)[3].

Recall that two connected yet somewhat distinct subareas represent the e-health discipline: those that focus on management IT-related issues and those that focus on clinical IT-related issues (Oh et al., 2005). Personal research interests are a key factor that motivates scholars to conduct research and contribute to science (Kim, Pedersen, & Cloud, 2007). Academics read and submit their works to journals that cater to their chosen area of concentration, and, as a result, they become familiar with corresponding journals. Evidence suggests that, during journal ranking surveys, respondents tend to assign higher scores to the journals they are familiar with and under-rate the ones that do not fall in their area of expertise (Ballas & Theoharakis, 2003; Serenko & Bontis, 2011). Therefore, we constructed two separate ranking lists and classified each journal as either management- or clinical-focused depending on our analyzing:

1. The journal's mission, call for papers' descriptions, and special issue topics.
2. The journal's appeal to certain groups of e-health readers to solicit contributions in the different research domains specific to either management- or clinical-related issues).
3. The composition of the journal's editorial review board members, their expertise, and their known published areas of expertise.
4. The composition of contributors whose papers have been accepted for publications, their expertise, and areas they concentrate on (i.e., on management- or clinical-related issues).
5. Key citations of work published in the journal (i.e., whether they drew from management-related IT disciplinary journals or clinical-oriented disciplinary journals).

Note that some journals do have a somewhat "split" focus between management and clinical issues, though it is not difficult for a learned expert in e-health who has published in both camps to detect whether a journal leans toward management or clinical issues. Two e-health researchers developed the classification of journals: one senior e-health scholar who is an editor-in-chief of an established e-health journal with a strong publication record in the discipline (the third author) and a junior e-health researcher (the second author). As a result, we developed two journal lists: 1) management focused (35 journals) and 2) clinical focused (28 journals). In total, the two lists of journals we ranked in the present study contained 19 journals that Le Rouge and De Leo (2010) included in their study and 44 new journals. We excluded some journals that Le Rouge and De Leo ranked because they were out of print at the date we conducted our study, were pure professional (non-peer-reviewed) magazines, merged with other journals and had changed names, or changed their focus and were more suitable for inclusion in rankings of journals in other disciplines (e.g., engineering, physics, artificial intelligence, medicine).

Owing to potential order-effect bias in journal ranking surveys (Serenko & Bontis, 2013a), we automatically randomized the order of journals for each respondent. To avoid the "path dependency" problem (Truex, Cuellar, & Takeda, 2009), respondents could add and rank up to three additional journals for each group. We asked respondents to rank each journal's overall contribution on a seven-point Likert-type scale (0: none, 1: marginal, 2: some, 3: average, good: 4, very good: 5, outstanding: 6), and we aggregated the scores for each journal. Because many researchers refer to the e-health discipline either as health informatics or health IT, we mentioned both names (health informatics and health IT) at the survey webpage. We also collected participants' basic demographic data.

We randomly selected 50 author names and email addresses from each journal to ascertain that the same number of authors represented each journal. We applied no discriminatory criteria (e.g., author position, affiliation, seniority, paper title, etc.). Generally, we first selected the names from the journals' most recent volumes. We selected each author's name only once. As a result, the list of respondents contained names and email addresses of 3,150 unique authors who published at least one paper in one of the ranked journals. Overall, we believed that these individuals were active e-health researchers who were familiar with and were qualified to judge the quality of journals in this discipline. We sent each respondent an email invitation to complete an online survey followed by three weekly reminders. We recorded and used IP addresses to remove duplicate submissions.

[3] In January 2017, Jeffrey Beall took down the list of predatory journals and publishers from his website. Please refer to https://www.insidehighered.com/news/2017/01/18/librarians-list-predatory-journals-reportedly-removed-due-threats-and-politics for detail. A copy of this list is available from the authors of this study.

4 Results

Out of 3,150 email invitations, 303 bounced back, and 429 people attempted to complete the survey. After removing 31 empty, partially complete, or duplicate entries, we retained 398 usable responses for analysis (a 14% response rate, which online survey research considers to be acceptable). It is also higher than the 9.7 percent response rate that Le Rouge and De Leo (2010) report. The actual response rate was higher because we received 270 automatic “on-vacation” replies, and we did not know whether these individuals read the survey invitation emails. In addition, some respondents’ spam filters likely mistakenly identified the email invitations as unsolicited messages and removed them before they reached the recipients. We received 46 percent of the responses after the initial invitation and 27, 14, and 13 percent after the first, second, and third reminder, respectively.

Researchers from 46 different countries participated in the study. Most came from the USA (33%), Canada (10%), the UK (8%), Australia (6%), Germany (4%), Italy (4%), and India (3%). Thirty-three percent were female. Eighty-three, 14, and three percent had a doctoral, master’s, or bachelor’s degree, respectively. Seventy-eight, eight, and five percent were an academic, practitioner, or students, respectively. Nine percent were scholarly administrators, researchers at non-academic institutions, medical writers, clinical experts, and others. On average, the respondents had nine years of research experience in the e-health discipline, and they had 12 years of full-time academic and eight years of non-academic work experience. Thus, we assured some degree of participation by active industry practitioners (i.e., non-academics).

Overall, the respondents did not encounter nor report any difficulty completing the online survey. In addition to the listed journals, they occasionally added and ranked new journals. However, most of these journals were reported only a few times. Whereas these journals had published e-health-relevant papers, they did not focus on e-health. Examples include *IEEE Transactions on Biomedical Engineering*, *Medical Decision Making*, *European Journal of Health Economics*, *British Medical Journal*, *Ultrasound in Medicine & Biology*, and others. Several respondents mentioned *Studies in Health Technology and Informatics*, but it was published as a book (not as a peer-reviewed journal) and, therefore, was excluded from the ranking list. Respondents also reported several non-English language journals and professional (non-peer-reviewed) magazines. Thus, we added no new journals to the list of ranked outlets. At the same time, some respondents indicated that the survey presented *Journal of Innovation in Health Informatics* under its former name *Informatics in Primary Care (formerly The Journal of Informatics in Primary Care)*. Thus, we adjusted this journal’s name in the final ranking list.

Tables 1 and 2 (below) present the ranking of e-health management-focused and clinical-focused journals, respectively. As Gillenson and Stafford (2008) suggest, we assigned tiers so that the list contains approximately five percent of A+, 20 percent of A, 50 percent of B, and 25 percent of C journals. As expected, we observed positive Spearman’s rank correlations between a journal’s score and its longevity (years in print) ($\rho = 0.40$, $p < 0.05$ for management-focused journals and $\rho = 0.33$, $p < 0.1$ for clinical-focused journals).

Table 1. Ranking of E-health Management-focused Journals

Tier	Rank	Title	Year launched	Score
A+	1	*Journal of the American Medical Informatics Association*	1994	1,270
A+	2	*Journal of Medical Internet Research*	1999	930
A	3	*JMIR Medical Informatics*	2013	695
A	4	*Methods of Information in Medicine*	1962	544
A	5	*Journal of Telemedicine & Telecare*	1995	493
A	6	*JMIR mHealth and uHealth*	2013	492
A	7	*Health Informatics Journal*	1995	473
A	8	*Telemedicine and e-Health (formerly Telemedicine Journal, formerly Telemedicine Journal and e-Health)*	1995	453
A	9	*Journal of Medical Systems*	1977	452
B	10	*Health Policy and Technology*	2012	338
B	11	*Journal of Health & Medical Informatics*	2010	331
B	12	*IIE Transactions on Healthcare Systems Engineering*	2011	330
B	13	*International Journal of Healthcare Information Systems and Informatics*	2006	313
B	14	*International Journal of Healthcare Technology and Management*	1999	285
B	15	*Journal of the International Society for Telemedicine and eHealth*	2013	272
B	16	*Informatics for Health and Social Care (formerly Medical Informatics)*	1976	271
B	17	*International Journal of Technology Assessment in Health Care*	1985	261
B	18	*International Journal of Telemedicine and Applications*	2008	258
B	19	*Health Informatics: An International Journal*	2012	251
B	20	*Technology and Health Care*	1993	236
B	21	*International Journal of Computers in Healthcare*	2010	233
B	22	*Online Journal of Public Health Informatics*	2009	231
B	23	*Journal of Medical Informatics & Technologies*	2000	230
B	24	*International Journal of Medical Engineering and Informatics*	2008	214
B	25	*Electronic Journal of Health Informatics*	2006	210
B	26	*Health Information Science and Systems*	2013	194
C	27	*Journal of Health Informatics in Developing Countries*	2007	189
C	28	*International Journal of E-Health and Medical Communications*	2010	187
C	29	*International Journal of Electronic Healthcare*	2004	180
C	30	*Indian Journal of Medical Informatics*	2006	170
C	31	*International Journal of Privacy and Health Information Management*	2013	140
C	32	*Journal of Health Informatics in Africa*	2013	123
C	33	*International Journal of Reliable and Quality E-Healthcare*	2012	113
C	34	*International Journal of Monitoring and Surveillance Technologies Research*	2013	83
C	35	*International Journal of User-Driven Healthcare*	2011	79

Table 2. Ranking of E-health Clinical-focused Journals

Tier	Rank	Title	Year launched	Score
A+	1	*BMC Medical Informatics and Decision Making*	2001	787
A+	2	*IEEE Journal of Biomedical and Health Informatics (formerly the IEEE Transactions on Information Technology in Biomedicine)*	1997	731
A	3	*International Journal of Medical Informatics (formerly International Journal of Bio-Medical Computing)*	1970	633
A	4	*Journal of Biomedical Informatics (formerly Computers and Biomedical Research)*	1967	596
A	5	*Applied Clinical Informatics*	2009	414
A	6	*Computer Methods and Programs in Biomedicine (formerly Computer Programs in Biomedicine)*	1970	324
A	7	*Journal of Innovation in Health Informatics (formerly Informatics in Primary Care, formerly The Journal of Informatics in Primary Care)*	1991	302
B	8	*Applied Medical Informatics*	1995	270
B	9	*CIN: Computers, Informatics, Nursing (formerly Computers in Nursing)*	1983	253
B	10	*Computers in Biology and Medicine: An International Journal*	1970	242
B	11	*Computer Methods in Biomechanics and Biomedical Engineering*	1997	203
B	12	*Acta Informatica Medica*	1993	197
B	13	*Journal of Digital Imaging*	1988	179
B	14	*Journal of Computational Medicine*	2014	171
B	15	*Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization*	2013	159
B	16	*The Open Medical Informatics Journal*	2007	141
B	17	*International Journal of Computational Models and Algorithms in Medicine*	2010	137
B	18	*Computerized Medical Imaging and Graphics (formerly Computerized Radiology, formerly Computerized Tomography)*	1977	129
B	19	*Canadian Journal of Nursing Informatics (formerly Canadian Nursing Informatics Journal)*	2006	119
B	20	*International Journal of Computer Assisted Radiology and Surgery*	2006	118
B	21	*Network Modeling Analysis in Health Informatics and Bioinformatics*	2012	111
C	22	*Journal of Computer Assisted Tomography*	1977	109
C	23	*Computer Aided Surgery (formerly Journal of Image Guided Surgery)*	1995	102
C	24	*Journal of Pathology Informatics*	2010	99
C	25	*Radiologic Technology*	1929	90
C	26	*Bio-Algorithms and Med-Systems*	2005	86
C	27	*Journal of Computational Surgery*	2014	83
C	28	*International Journal of Computerized Dentistry*	1998	58

5 Discussion and Conclusion

In this study, we developed a ranking of e-health academic journals. To do so, we surveyed 398 active e-health researchers and created two ranking lists: one each for management- and clinical-centered e-health journals.

The researchers ranked *Journal of the American Medical Informatics Association* and *Journal of Medical Internet Research* as the leading A+ management-focused e-health journals. Both journals received very high-ranking scores that placed them in the most prestigious journal league. The next cohort of seven A journals (i.e., *JMIR Medical Informatics*, *Methods of Information in Medicine*, *Journal of Telemedicine & Telecare*, *JMIR mHealth and uHealth*, *Health Informatics Journal*, *Telemedicine and e-Health*, and *Journal of Medical Systems*) also received high scores of over 450. Starting at the B journals, the scores quickly diminished and dropped below 200 at the end of the B cohort. We observed a similar situation with the clinical-focused journals. *BMC Medical Informatics and Decision Making* and *IEEE Journal of Biomedical and Health Informatics* received high scores and earned the A+ ranking. *International Journal of Medical Informatics*, *Journal of Biomedical Informatics*, *Applied Clinical Informatics*, *Computer Methods and Programs in Biomedicine*, *Journal of Innovation in Health Informatics*, and *Journal of Medical Systems* were also well-ranked in the A category, and the scores in the B cohort quickly declined. In the C groups, ranking scores were very low. These findings show that the e-health domain has a small, strong group of well-known and respected management- and clinical-centered journals and that researchers consider the other journals as less prestigious.

Importantly, this noted phenomenon has both advantages and disadvantages. On the one hand, active researchers are well aware of the value and contribution of a small group of e-health journals; they are likely to read their papers and send them their best manuscripts. On the other hand, a small group of elite outlets may attract a disproportionately large number of submissions of mostly good quality. At some point, these journals may become overwhelmed with the volume of submissions. In turn, this problem may create somewhat unrealistic expectations of quality and rigor and result in the rejection of innovative, unique, and potentially groundbreaking works. One may avoid this problem, however, if the editorial board becomes aware of this issue and takes proactive measures to ensure a realistic yet rigorous standard of quality.

Comparing our ranking lists with Le Rouge and De Leo's (2010) list reveals both consistencies and stark discrepancies. In terms of similarities, *Journal of the American Medical Informatics Association* topped all lists. *IEEE Journal of Biomedical and Health Informatics (formerly the IEEE Transactions on Information Technology in Biomedicine)* was consistently ranked in the top category. The relative position of several other journals (e.g., *Journal of Biomedical Informatics*, *International Journal of Medical Informatics*, *Methods of Information in Medicine*) was also consistent between the lists. With respect to differences, some journals (e.g., *Journal of Telemedicine & Telecare*, *Health Informatics Journal*, *Journal of Medical Systems*) were ranked higher in our study. Particularly, *BMC Medical Informatics and Decision Making*, which our study ranked as a top A+ clinical-centered journal, appeared only in the middle of Le Rouge and De Leo's list. This finding shows that perceptions of e-health journals quality frequently change, which reflects the dynamic nature of the discipline and calls for frequent updates of journal ranking lists.

Recall that we observed a positive correlation between a journal's score and its longevity measured as years in print ($\rho = 0.40$, $p < 0.05$ and $\rho = 0.33$, $p < 0.1$ for management- and clinical-focused journals, respectively). This finding shows that longer-standing journals fare better in survey-based ranking lists than their more recent counterparts. One can explain this finding theoretically. First, regardless of their actual quality, the titles of older journals usually sound more familiar than those of newer ones. In journal-ranking surveys, respondents tend to assign higher scores to those journals whose titles sound more familiar regardless of their actual scientific contribution (Boor, 1973; Levin & Kratochwill, 1976; Serenko & Bontis, 2011), which inflates the ranking scores of longer-standing outlets. Second, the more papers a journal has published, the higher the chance that at least some of them are good quality works. The research community notices them, and they become associated with the journal's title. In turn, these factors positively affect a journal's ranking score. Third, the longer the journal stays in print, the more people have an opportunity to become more affiliated with it. Empirical evidence suggests that journal quality perceptions are positively related to the respondents' affiliation with the journal: survey respondents who previously published in or served on an editorial board of a journal tend to rank it higher than those who did not (Ballas & Theoharakis, 2003). At the same time, whereas the present study confirms the influence of longevity on a journal's ranking position, it also shows many examples of journals that could overcome its effect. For instance, based on our ranking list, an average clinical-focused journal began in 1993, but the A+ clinical-centered journals began in 2001 and 1997. Both tables have A journals founded in 2009 and 2013, and the bottom of B and C cohorts have older journals. In addition, a correlation of 0.4 means that longevity explained only 16 percent of the ranking score, which leaves 84 percent to other factors. Thus, we can conclude that, even though older journals have an advantage over their younger counterparts, this advantage is far from absolute.

We also found that around one-third of all active e-health researchers came from the USA followed by Canada, the UK, and Australia. This finding is not surprising because the USA leads in the volume of scientific output in most areas (e.g., see Schulz & Manganote, 2012). At the same time, concentrating a large proportion of scientific research in a single country may impede the progress of e-health research because national and cultural differences may play an important role in the adoption of e-health technologies, practices, and recommendations, which emphasizes a need for more location-based research.

In this study, we assumed that the e-health discipline largely comprises two interrelated yet somewhat distinct areas. As a result, we developed two unique ranking lists. On the one hand, we believe that this decision improved the validity of the results and helped each journal obtain its "true" ranking position. On the other hand, one may argue that the difference between these two groups is somewhat elusive, and it may be difficult to correctly classify all journals being ranked. As we mention above, researchers have noted and detailed the different historical evolution of the clinical versus management side of e-health (Kaplan, 1988; Le Rouge & De Leo, 2010; Oh et al., 2005). Historically, many have viewed (and still may do so, especially those in clinical disciplines) medical- and clinical-centered e-health research as distinct and separate subdisciplines that are part of the today's more integrated, encompassing e-health discipline.

On the clinical side, e-health specialist researchers worked on improving methods to aid the meaningful use of clinical datasets and the deployment of computer-aided devices and software to ease diagnostic, therapeutic, and care-monitoring services. These researchers typically emphasized improving clinical practices rather than building theory because the end users of their developed systems are often the specialist caregivers themselves. This observation is especially true when medical specialist and clinical systems developers lack professional IS and/or IT programming support, which gives to "clinician-developed" systems that cater primarily for clinical specialists and clinical end users. Early e-health pioneers (who were often clinical specialists, such as physicians, dentists, nurses, and pharmacists) often developed their own systems for specialist users in a tight community given the noted lack of IS and IT professionals and/or generalists who can claim to be knowledge experts in the various clinical specialty domains. MYCIN, for example, was among the first clinical expert systems developed and championed by a physician's mentoring other younger physician programmers to generate similar types of systems intended only for physician users (Shortliffe, 1977). Longstanding journals that emphasize the clinical domain have specialties in medical informatics, nursing informatics, biomedical informatics, dentistry informatics, pharmaceutical informatics, teleradiology, and other types of clinical specialty informatics.

On the management side, e-health researchers, who often had an IS, IT, and management background, worked on retrieving, storing, visualizing, and exchanging health-related records. These researchers often contributed to the understanding of information systems design, systems development approaches, implementation, integration, acceptance, use, and diffusion of various computerized systems in the healthcare domain. They often drew on insights from a wide array of healthcare professionals and many other people involved in some aspect of the delivery of healthcare. They also emphasized the development of theory that can assist in explaining the application of technology to healthcare processes. With the increasing use of an interdisciplinary focus in healthcare and the technological means to do so, it is possible and advisable to encourage active collaboration among clinical- and management-oriented researchers to accelerate scientific progress.

By drawing attention to the existence of these two different schools of thought, one might see this paper as fostering a split in the e-health domain, compromising intra-disciplinary collaboration, and hindering the advancement of e-health research. Empirical evidence reveals that strong and healthy collaborative networks are necessary to ensure a continuous improvement of the quality, quantity, and impact of scientific research output (Chung, Cox, & Kim, 2009; Liao, 2011). The e-health discipline's perceived duality may divide researchers into two camps, which does not bode well with the spirit of cooperation and collaboration. Conversely, not identifying and separating e-health journals into the two different orientations but treating e-health journals as if they were a single group would have also brought about several undesired risks in this work. Given the disparate historical evolution of the two groups, their respective credentials, theoretical emphasis, and philosophical cultures, requesting survey participants to compare the works of two distinct groups of researchers with each other may have confused respondents, confounded ranking results, and posed potential threats to the methodological soundness and rigor of our study. Thus, we emphasize that readers should interpret our developing two ranking lists of clinical- and management-centered e-health journals as a methodological necessity and not as our endorsing intra-disciplinary division.

Given that e-health as a research area is inherently interdisciplinary and that researchers from a wide variety of domains may and do contribute to e-health research, it is not inconceivable that this area comprises several sub-areas, subfields, subdisciplines, or branches as other disciplines do and yet all still contribute to an overarching goal. For instance, larger areas, such as mathematics, comprise algebra, finance, geometry, and others. With that, readers could interpret the creation of two ranking lists as recognition that there are perhaps many branches of e-health research, some of which are more applicable and accessible to some researchers than they are to others. Moreover, it may expose narrowly focused academics and professionals, who would normally be associated with their respective professions and research communities, to knowledge that they would not have otherwise been exposed to. Such a phenomenon may even have a positive effect to encourage researchers from a wide variety of areas to conduct studies that can contribute to an all-encompassing discipline.

Despite the various benefits that one may derive from using the ranking list we developed, we warn that incorrectly applying it may result in unintended consequences for many e-health stakeholders. We did not develop the list for research administrators/managers to blindly assess a researcher's credentials or scientific contributions. The fact that a journal of high/low rank published a paper does not automatically endorse the latter's high/low quality and impact: a study's content, not just the journal in which it appears, determines its worth.

Ranking lists have become an irrevocable attribute of all scientific disciplines. If used appropriately, they may facilitate discipline development, help scholars achieve internal and external recognition, and define a discipline's evolving identity. We hope that the ranking list we present here serves its purpose in creating a stronger e-health discipline.

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References

Ahern, D. K., Kreslake, J. M., & Phalen, J. M. (2006). What is eHealth: Perspectives on the evolution of eHealth research. *Journal of Medical Internet Research, 8*(1), e4.

Ammon, U. (Ed.). (2001). *The dominance of English as a language of science: Effects on other languages and language communities*. Berlin: Mouton de Gruyter.

Atienza, A. A., Hesse, B. W., Baker, T. B., Abrams, D. B., Rimer, B. K., Croyle, R. T., & Volckmann, L. N. (2007). Critical issues in eHealth research. *American Journal of Preventive Medicine, 32*(5S), S71-S74.

Ballas, A., & Theoharakis, V. (2003). Exploring diversity in accounting through faculty journal perceptions. *Contemporary Accounting Research, 20*(4), 619-644.

Beets, S. D., Lewis, B. R., & Brower, H. H. (2016). The quality of business ethics journals: An assessment based on application. *Business & Society 55*(2), 188-213.

Bjørn-Andersen, N., & Sarker, S. (2009). Journal self-citation IX: The power of the unspoken in journal referencing. *Communications of the Association for Information Systems, 25*(9), 79-84.

Blackmore, P., & Kandiko, C. B. (2011). Motivation in academic life: A prestige economy. *Research in Post-Compulsory Education 16*(4), 399-411.

Boor, M. (1973). Unfamiliarity breeds disdain: Comment on department chairmen's ratings of psychological journals. *American Psychologist, 28*(11), 1012-1013.

Boyer, E. L., Moser, D., Ream, T. C., & Braxton, J. M. (2016). *Scholarship reconsidered: Priorities of the professoriate*. San Francisco: Jossey-Bass.

Chen, L., Holsapple, C. W., Hsiao, S.-H., Ke, Z., Oh, J.-Y., & Yang, Z. (Forthcoming). Knowledge-dissemination channels: Analytics of stature evaluation. *Journal of the Association for Information Science and Technology.*

Chen, Z., Gong, C., Lin, L., Xu, S., Zhang, M., & Zhou, X. (2015). Assessing junior faculty research productivity in the IS field: Recommendations for promotion and tenure standards for Asian schools. *Communications of the Association for Information Systems, 36*, 357-368.

Chung, K. H., Cox, R. A. K., & Kim, K. (2009). On the relation between intellectual collaboration and intellectual output: Evidence from the finance academe. *Quarterly Review of Economics and Finance, 49*(3), 893-916.

Cousins, K. (2016). Health IT legislation in the United States: Guidelines for IS researchers. *Communications of the Association for Information Systems, 39*, 338-366.

Davis, G. F. (2014). Editorial essay: Why do we still have journals? *Administrative Science Quarterly, 59*(2), 193-201.

Della Mea, V. (2001). What is e-health: The death of telemedicine? *Journal of Medical Internet Research, 3*(2), e22.

Eysenbach, G. (2001). What is e-health? *Journal of Medical Internet Research, 3*(2), e20.

Eysenbach, G. (2008). Medicine 2.0: Social networking, collaboration, participation, apomediation, and openness. *Journal of Medical Internet Research, 10*(3), e22.

Eysenbach, G., & Diepgen, T. L. (2001). The role of e-health and consumer health informatics for evidence-based patient choice in the 21st century. *Clinics in Dermatology, 19*(1), 11-17.

Ferratt, T. W., Gorman, M. F., Kanet, J. J., & Salisbury, D. (2007). IS journal quality assessment using the author affiliation index. *Communications of the Association for Information Systems, 19*, 710-724.

Gillenson, M., & Stafford, T. (2008). Journal rankings 2008: A synthesis of studies. In *Proceedings of the 14th Americas Conference on Information Systems* (pp. 1-12).

Gursoy, D., & Sandstrom, J. K. (2016). An updated ranking of hospitality and tourism journals. *Journal of Hospitality & Tourism Research, 40*(1), 3-18.

Hardré, P., & Mortensen, C. (2014). Education journals: Two decades of change and implications for the field. *Journal of the Association for Information Science and Technology, 65*(1), 188-200.

Hersh, W. (2009). A stimulus to define informatics and health information technology. *BMC Medical Informatics and Decision Making, 9*(24).

Hesse, B. W., & Shneiderman, B. (2007). eHealth research from the user's perspective. *American Journal of Preventive Medicine, 32*(5), S97-S103.

Hughes, B., Joshi, I., & Wareham, J. (2008). Health 2.0 and medicine 2.0: Tensions and controversies in the field. *Journal of Medical Internet Research, 10*(3), e23.

Jiang, L. C., Wang, Z.-Z., Peng, T.-Q., & Zhu, J. J. H. (2015). The divided communities of shared concerns: Mapping the intellectual structure of e-Health research in social science journals. *International Journal of Medical Informatics, 84*(1), 24-35.

Kampov-Polevoi, J., & Hemminger, B. M. (2011). A curricula-based comparison of biomedical and health informatics programs in the USA. *Journal of the American Medical Informatics Association, 18*(2), 195-202.

Kaplan, B. (1988). Development and acceptance of medical information systems: An historical overview. *Journal of Health and Human Resources Administration, 11*(1), 9-29.

Kim, H.-S., Pedersen, E., & Cloud, R. (2007). Social support, research interest, stress, and research productivity of textiles and apparel faculty. *Clothing and Textiles Research Journal, 25*(2), 156-170.

Kordzadeh, N., & Warren, J. (2013). Toward a typology of health 2.0 collaboration platforms and websites. *Health and Technology, 3*(1), 37-50.

Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Kuhn, T. S. (1977). *The essential tension: Selected studies in scientific tradition and change*. Chicago: University of Chicago Press.

Le Rouge, C. M., & De Leo, G. (2010). Information systems and healthcare XXXV: Health informatics forums for health information systems scholars. *Communications of the Association for Information Systems, 27*, 99-112.

Levin, J. R., & Kratochwill, T. R. (1976). The name of the journal fame game: Quality or familiarity? *American Psychologist, 31*(9), 673-674.

Liao, C. (2011). How to improve research quality? Examining the impacts of collaboration intensity and member diversity in collaboration networks. *Scientometrics, 86*(3), 747-761.

Lowry, P. B., Humphreys, S., Malwitz, J., & Nix, J. (2007a). A scientometric study of the perceived quality of business and technical communication journals. *IEEE Transactions on Professional Communication, 50*(4), 352-378.

Lowry, P. B., Karuga, G. G., & Richardson, V. J. (2007b). Assessing leading institutions, faculty, and articles in premier information systems research journals. *Communications of the Association for Information Systems, 20*, 142-203.

Manzari, L. (2013). Library and information science journal prestige as assessed by library and information science faculty. *The Library Quarterly, 83*(1), 42-60.

McKercher, B. (2005). A case for ranking tourism journals. *Tourism Management, 26*(5), 649-651.

McKercher, B., Law, R., & Lam, T. (2006). Rating tourism and hospitality journals. *Tourism Management, 27*(6), 1235-1252.

Menachemi, N., Hogan, T. H., DelliFraine, J. L., & Flaks, J. A. (2015). Journal rankings by health management faculty members: Are there differences by rank, leadership status, or area of expertise? *Journal of Healthcare Management, 60*(1), 17-29.

Messer-Davidow, E., Shumway, D. R., & Sylvan, D. J. (Eds.). (1993). *Knowledges: Historical and critical studies in disciplinarity*. Charlottesville, VA: The University Press of Virginia.

Milne, M. (2000). Toward the end of academic freedom, diversity, judgement and accountability: A critique of Cassar and Holmes' (1999) journal yardsticks. *Accounting, Accountability and Performance, 6*(1), 99-116.

Mingers, J., & Willmott, H. (2013). Taylorizing business school research: On the "one best way" performative effects of journal ranking lists. *Human Relations, 66*(8), 1051-1073.

Monastersky, R. (2005). The number that's devouring science. *The Chronicle of Higher Education, 52*(8), A12.

Mukherjee, A., & McGinnis, J. (2007). E-healthcare: An analysis of key themes in research. *International Journal of Pharmaceutical and Healthcare Marketing, 1*(4), 349-363.

Nie, K., Ma, T., & Nakamori, Y. (2009). An approach to aid understanding emerging research fields—the case of knowledge management. *Systems Research and Behavioral Science, 26*(6), 629-643.

Oh, H., Rizo, C., Enkin, M., & Jadad, A. (2005). What is eHealth: A systematic review of published definitions. *Journal of Medical Internet Research, 7*(1), e1.

Oldenburg, H. (1665). Introduction. *Philosophical Transactions of the Royal Society, 1*(1), 1-2.

Pagliari, C., Sloan, D., Gregor, P., Sullivan, F., Detmer, D., Kahan, J. P., Oortwijn, W., & MacGillivray, S. (2005). What is eHealth (4): A scoping exercise to map the field. *Journal of Medical Internet Research, 7*(1), e9.

Polašek, O., & Kern, J. (2012). Medical informatics across Europe: Analysis of medical informatics scientific output in 33 European countries. *Informatics for Health and Social Care, 37*(1), 12-21.

Price, D. J. d. S. (1961). *Science since Babylon*. New Haven: Yale University Press.

Rokach, L. (2012). Applying the publication power approach to artificial intelligence journals. *Journal of the Association for Information Science and Technology, 63*(6), 1270-1277

Rousseau, R. (1999). Temporal differences in self-citation rates of scientific journals. *Scientometrics, 44*(3), 521-531.

Rousseau, S. (2008). Journal evaluation by environmental and resource economists: A survey. *Scientometrics, 77*(2), 223-233.

Saarela, M., Kärkkäinen, T., Lahtonen, T., & Rossi, T. (2016). Expert-based versus citation-based ranking of scholarly and scientific publication channels. *Journal of Informetrics, 10*(3), 693-718.

Sangster, A. (2011). The ABS journal quality guide: A personal view. *Accounting Education: An International Journal, 20*(6), 575-580.

Sangster, A. (2015). You cannot judge a book by its cover: The problems with journal rankings. *Accounting Education, 24*(3), 175-186.

Schulz, P., & Manganote, E. (2012). Revisiting country research profiles: Learning about the scientific cultures. *Scientometrics, 93*(2), 517-531.

Seglen, P. O. (1992). The skewness of science. *Journal of the American Society for Information Science, 43*(9), 628-638.

Serenko, A. (2010). The development of an AI journal ranking based on the revealed preference approach. *Journal of Informetrics, 4*(4), 447-459.

Serenko, A., & Bontis, N. (2009a). A citation-based ranking of the business ethics scholarly journals. *International Journal of Business Governance and Ethics, 4*(4), 390-399.

Serenko, A., & Bontis, N. (2009b). Global ranking of knowledge management and intellectual capital academic journals. *Journal of Knowledge Management, 13*(1), 4-15.

Serenko, A., & Bontis, N. (2011). What's familiar is excellent: The impact of exposure effect on perceived journal quality. *Journal of Informetrics, 5*(1), 219-223.

Serenko, A., & Bontis, N. (2013a). First in, best dressed: The presence of order-effect bias in journal ranking surveys. *Journal of Informetrics, 7*(1), 138-144.

Serenko, A., & Bontis, N. (2013b). Global ranking of knowledge management and intellectual capital academic journals: 2013 update. *Journal of Knowledge Management, 17*(2), 307-326.

Serenko, A., & Bontis, N. (2017). Global ranking of knowledge management and intellectual capital academic journals: 2017 update. *Journal of Knowledge Management, 21*(3): 675-692.

Serenko, A., Bontis, N., & Hull, E. (2011). Practical relevance of knowledge management and intellectual capital scholarly research: Books as knowledge translation agents. *Knowledge and Process Management, 18*(1), 1-9.

Serenko, A., Bontis, N., & Moshonsky, M. (2012). Books as a knowledge translation mechanism: Citation analysis and author survey. *Journal of Knowledge Management, 16*(3), 495-511.

Serenko, A., & Dohan, M. (2011). Comparing the expert survey and citation impact journal ranking methods: Example from the field of artificial intelligence. *Journal of Informetrics, 5*(4), 629-648.

Sevinc, A. (2004). Manipulating impact factor: An unethical issue or an editor's choice? *Swiss Medical Weekly, 134*(27), 410.

Shortliffe, E. H. (1977). MYCIN: A knowledge-based computer program applied to infectious diseases. In *Proceedings of the Annual Symposium on Computer Application in Medical Care* (pp. 66-69).

Starbuck, W. H. (2003). Turning lemons into lemonade: Where is the value in peer reviews? *Journal of Management Inquiry, 12*(4), 344-351.

Starbuck, W. H. (2016). 60th anniversary essay: How journals could improve research practices in social science. *Administrative Science Quarterly, 61*(2), 165-183.

Straub, D. W., & Anderson, C. (2009). Journal self-citation VI: Forced journal self-citation—common, appropriate, ethical? *Communications of the Association for Information Systems, 25*, 57-66.

Truex, D., Cuellar, M., & Takeda, H. (2009). Assessing scholarly influence: Using the Hirsch indices to reframe the discourse. *Journal of the Association for Information Systems, 10*(7), 560-594.

Ückert, F., Ammenwerth, E., Dujat, C., Grant, A., Haux, R., Hein, A., Hochlehnert, A., Knaup-Gregori, P., Kulikowski, C., Mantas, J., Maojo, V., Marschollek, M., Moura, L., Plischke, M., Röhrig, R., Stausberg, J., Takabayashi, K., Winter, A., Wolf, K.-H., & Hasman, A. (2014). Past and next 10 years of medical informatics. *Journal of Medical Systems, 38*(74), 1-7.

Van De Belt, T. H., Engelen, L. J. L. P. G., Berben, S. A. A., & Schoonhoven, L. (2010). Definition of Health 2.0 and Medicine 2.0: A systematic review. *Journal of Medical Internet Research, 12*(2), e18.

Weigel, F. K., Rainer, R. K., Jr., Hazen, B. T., Cegielski, C. G., & Ford, F. N. (2013). Uncovering research opportunities in the Medical Informatics field: A quantitative content analysis. *Communications of the Association for Information Systems, 33*, 15-32.

Weiner, G. (2001). The academic journal: Has it a future? *Education Policy Analysis Archives, 9*(9), 1-19.

WHO. (2005). *eHealth in World Health Organization. Resolutions and decisions. WHA58.28 eHealth.* Geneva, Switzerland: World Health Organization.

Wilson, E. V., Wang, W., & Sheetz, S. D. (2014). Underpinning a guiding theory of patient-centered e-health. *Communications of the Association for Information Systems, 34*, 337-350.

Wilson, V., Balkan, S., & Lankton, N. K. (2014). Trends in U.S. consumers' use of e-health services: Fine-grained results from a longitudinal, demographic survey. *Communications of the Association for Information Systems, 34*, 1417-1434.

Winkelman, W. J., & Choo, C. W. (2003). Provider-sponsored virtual communities for chronic patients: Improving health outcomes through organizational patient-centred knowledge management. *Health Expectations, 6*(4), 352-358.

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