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ARTICLE

What do we know about no-show behavior? A systematic, interdisciplinary literature review

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Abstract

No-show behavior, a distinct form of absenteeism, is often problematic, particularly in the service industry. Given the growing relevance of the phenomenon in the industry, an increasing number of researchers from such different disciplines as educational economics, healthcare management research, and sports economics have begun examining both the potential antecedents and measures to counteract no-show behavior, recently. Although the continuously growing body of literature on no-show behavior has been reviewed before, most such previous attempts were neither interdisciplinary nor systematic, sometimes lacking both completeness and thoroughness. In this article, we address this gap in the still-emerging literature by providing a systematic, interdisciplinary review of the literature. We observe that, although the potential antecedents are manifold and not always neatly comparable across the different industries, there still exist commonalities, most of which are related to product characteristics and the opportunity costs arising from physical attendance. In contrast, although we document a promising effect of exploiting reminders in reducing no-show behavior, our understanding of the effectiveness of potential countermeasures is less pronounced.

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KEYWORDS

absenteeism, appointments, attendance, non-attendance, no-shows, scheduling

1 | INTRODUCTION

No-show behavior (NSB) of individuals is often problematic, in particular in the service industry. Although such behavior might harm the individual no-show in the long-term, today, service providers, and sometimes also uninvolved third parties, tend to bear the short-term consequences. For instance, while no-shows in the health industry may suffer from an interruption to care continuity (e.g., Kaplan-Lewis & Percac-Lima, 2013), it is the service provider, that is, the counterpart expecting in vain, that often observes productivity losses. At the same time, uninvolved third parties must endure unnecessarily increasing waiting times (e.g., Huang et al., 2017; Kheirkhah et al., 2015; Moore et al., 2001). In England, for example, no-show patients currently miss more than 15 million general practice appointments per year (NHS, 2019), most of which could have been assigned to other patients if canceled in time. In the live entertainment industry, spectator NSB may not only lead to operational inefficiencies, and ultimately diminishing returns, for a service provider (e.g., from a decline in income from selling beverage/food and overstaffing) but may also worsen the shared experience of those spectators in attendance. In this industry, in particular, some service providers, that is, professional sports clubs, might even observe a decline in the so-called home advantage (c.f., Reade et al., 2021), as well as an increase in future season ticket churn (e.g., McDonald, 2010). As a consequence, some service providers, most notably, perhaps, carriers in the increasingly competitive airline industry, have begun exploring measures to mitigate the symptoms arising from such NSB (e.g., Garrow & Koppelman, 2004a).

Given the growing relevance of the no-show phenomenon in the industry, an increasing number of researchers from such different disciplines as educational economics (e.g., McCluskey et al., 2004), healthcare management research (e.g., Harvey et al., 2017), and sports economics and management (e.g., Schreyer & Däuper, 2018) have begun examining the potential antecedents and measures to counteract NSB. However, although these authors have certainly improved our initial understanding, their research focus has been naturally rather narrow, concentrating either on one specific industry or, in many cases, even only a small fraction of that. Accordingly, while there already exist empirical explorations of NSB in elementary schools (e.g., McCluskey et al., 2004), various healthcare subspecialties (e.g., Geraghty et al., 2008), and the sports industry (e.g., Schreyer et al., 2019), interdisciplinary studies across different industries and sectors that adopt a broader, that is, more holistic, view on the underlying mechanisms at work are currently still mainly missing in the literature.

Although the continuously growing body of literature on NSB has been reviewed before (e.g., Stubbs et al., 2012), most such previous attempts were neither interdisciplinary nor systematic, sometimes lacking both completeness and thoroughness (c.f., Tranfield et al., 2003). For instance, while authors have increasingly summarized the literature on NSB in healthcare subspecialties such as Endoscopy (e.g., Lam et al., 2021), Pediatric (e.g., Bueno et al., 2020) or Radiology (e.g., Mieloszyk et al., 2019), to the best of our knowledge, there as yet only exists one review synthesizing the literature on the antecedents of such behavior across such subspecialties (Dantas et al., 2018), thus providing a more holistic picture on the underlying mechanisms in the healthcare industry. However, it remains largely unclear whether these initial findings are robust across

different industries, and, consequently, whether, and if so to what degree, service firms might be able to learn from each other across disciplines. Further, there seems to exist no comprehensive review synthesizing the effect of potential measures.

In this manuscript, we address this notable gap in the still-emerging NSB literature by providing a systematic, and more importantly, even, interdisciplinary review of the extant literature on the potential antecedents of and measures to reduce NSB across different industries. Although we initially focus on synthesizing what is already known about NSB, eventually, we also highlight what we do not know yet, thus providing a clear research agenda that will help the different fields increase our understanding of the phenomenon in the future.

We proceed as follows: In Section 2, we first lay the necessary groundwork for our subsequent literature review by providing a concise definition of NSB, which might be, occasionally, confused with absenteeism. In Section 3, we then, establish the relevance of this topic by shedding some initial light on the question of why NSB is of interest to economists, in particular. We elaborate on the methodology of our systematic literature review in Section 4 before we detail the results of our analysis in Section 5. Finally, in Section 6, we provide an agenda for future research and conclude, thereby also reflecting on the limitation of our survey.

2 | WHAT IS NO-SHOW BEHAVIOR?

As has been noted before (e.g., Schreyer et al., 2020), NSB is a particular form of absenteeism. However, unlike absentees, no-shows are unexcused and, thus, fail to show up for a scheduled appointment without prior notice or even further arrangements. As such, NSB contains an element of surprise for the counterpart expecting in vain (e.g., a service provider), who, in particular, if demand tends to exceed fixed capacity, then, typically, has to bear the short-term consequences, mostly financial, unless agreed otherwise in advance (e.g., in the form of no-show policies, including binding reservation and/or no-show fees). For instance, in the hospitality industry, a restaurant owner, typically operating on a rather small profit margin, is likely to earn negative returns if a customer breaks his appointment, while the service team must turn away walk-in customers at the door. In contrast, such operational inefficiencies are less likely, if a prospect absentee informs the expecting counterpart about an absence in advance, for example, by either canceling or by rescheduling the appointment in time. Intriguingly, in this particular environment, as in the most remaining service industries, no-show fees, which could help mitigate the financial consequences from such defective behavior to some degree, seem still to be the exception rather than the rule.

It is, perhaps, important to note that being a no-show is, therefore, not equivalent to being late, although being late might result in becoming a no-show in some industries. In the transportation industry, for example, being late for boarding might result in missing a departing ferry, plane, or train. As a result, here, the expecting counterpart, that is, the transportation service provider, would observe passenger NSB. In the entertainment industry, in contrast, being late to a football match, an opera, or a theatrical performance, for instance, often does not hinder consumption (anymore). Thus, being late in this particular environment is different from being a no-show; that is, unlike the late coming individual only arrives once the performance has already concluded.

Somewhat similarly, the question of whether NSB prevails might also depend on contextual differences in some cases. For instance, we would consider citizens who decide to omit to vote as no-shows if they have self-registered (e.g., in the US), but not if they are automatically registered (e.g., in Germany).

Finally, although our understanding of the dynamics of NSB (e.g., loss of trust, reciprocity) is still limited, such behavior is undoubtedly different from ghosting, much discussed in public recently, as it does not necessarily have to mark the end of a relationship (e.g., a service provider-client relationship). Naturally, being stood up by a no-show, however, can be the starting point to be ghosted, depending on subsequent interaction.

3 | WHY SHOULD WE CARE ABOUT NO-SHOW BEHAVIOR?

More recently, documenting NSB, primarily by reporting the so-called no-show rate (NSR), has become more prominent among both interested researchers and practitioners. For instance, in the health industry, Dantas et al. (2018) document that, on average, about 23% of all appointments are no-show appointments, with a range from 4% in intravenous therapy clinics to 79% in physiotherapy clinics. Intriguingly, the authors also observe some notable geographical differences in patient NSB, with such rates seemingly highest among those patients scheduled for an appointment in Africa (~43%), and somewhat lower for those in South America (~28), North America (~24), Europe (~19), and Oceania (~13).

Although NSRs might not be directly comparable across industries, and an interpretation requires the necessary caution, those rates observed in the healthcare industry (still) seem to be relatively high compared with NSRs in other industries. For instance, in the entertainment and sports industry, Schreyer (2019) observes a significant increase in German football spectator no-show recently, indicating that, on average, about 12% of all distributed tickets subsequently remain unused.¹ Somewhat similar, in the North American transportation industry, a NSR of between 6% and 10% is common among airline passengers (e.g., Lawrence et al., 2003). However, other service providers operating in this particular industry, most notably cruise operators, seem to be less plagued by no-shows (Toh et al., 2005), observing a NSR of only about 1%.

3.1 | Most service providers are likely to observe diminishing returns from no-show behavior

For most service providers, in particular, such regular NSRs among their supposed customers are likely to result in operational inefficiencies and, therefore, diminishing returns (e.g., Schreyer et al., 2020), at least in the short term. That is, in those industries where up-front payments are still not an established standard (e.g., in the beauty service, healthcare, and hospitality industry), in particular, the expecting counterpart might fail to fill the soon-to-be-missed appointments immediately, despite potential excess demand. As a result, personnel might be overstaffed, and sometimes perishable goods are unnecessarily wasted. In fact, in the healthcare industry, previous research has noted an estimated annual opportunity cost of over roughly \$10 m in Scotland (Scott & Lyon, 2005), \$190 m, just for general practitioners, in the UK (Beecham, 1999), and \$150 bn for the US healthcare system (Gier, 2017). Similarly, in the UK hospitality industry, restaurant owners apparently miss approximately \$20 bn in revenue each year because of NSB (Perrett, 2015). Even worse, in all these environments, in particular, the increase in waiting time may further negatively affect the reputation of the already punished service provider (Geraghty et al., 2008).

However, even those service providers generating their revenues upfront are likely to suffer from frequent NSB. For example, in the entertainment industry, were attending spectators become a part of the product experienced by not only attending third parties but sometimes also TV

audiences (e.g., in live concerts, sporting events), a decrease in the generated atmosphere due to numerous empty seats is likely to harm important stakeholder interests (e.g., broadcaster, business/hospitality seat owners, and sponsors (c.f., Schreyer et al., 2020)); which then worsens the service provider's future negotiating position. On the ground, these service providers are likely to suffer from a decrease in additional revenue, most notably from declining sales of food and beverages, merchandise, and parking tickets, but also resale fees. Anecdotal evidence has it that, in the hospitality industry, a filled restaurant is often considered to be of higher quality than an empty one – and this might apply across service sectors.

To paint a complete picture, it is, however, worth noting that some service providers are, in fact, able to exploit such NSB. For instance, in the fitness industry, where individuals often intend to build a positive habit but then apparently fail to do so on a yearly routine (e.g., DellaVigna & Malmendier, 2006), gym owners certainly profit from individual NSB by systematically overbooking their work-out capacities (e.g., Schreyer et al., 2019). Similarly, service providers that regularly observe more demand than supply, such as some few professional sporting teams, can benefit from NSB by employing predictive overbooking strategies, as can several transportation providers.

Similarly, as frequent NSB is a well-known antecedent of future churn (e.g., McDonald, 2010), some service providers might monitor such behavior, thereby building an early warning system. In this context, NSB might serve as early feedback, provided long before the resignation, which may then help a provider reshape the omitted service(s) to prevent such future churn. Naturally, this latter mechanism applies to any organization, that is, beyond service providers, as employee NSB might signal organizational culture (e.g., harassment) or leadership problems.

Finally, though, perhaps, less in focus, some service providers may also suffer from employee NSB, as long as these employees refrain from announcing an absence (e.g., due to an illness). As most employer-employee relationships are, however, strictly regulated by contract, these service providers, in particular, are more likely to suffer from absenteeism in the workplace (e.g., Beblo & Ortlieb, 2012; Jensen & McIntosh, 2007; Ziebarth, 2013) than from employee NSB.

3.2 | Third parties may suffer in the short-term

For attending third parties, NSB is likely to reduce the consumer experience in the short-term, among others. For instance, in the education industry, a student's learning experience often benefits from the shared experiences, including failures, of fellow students. As such, frequent student NSB may harm the development of the remaining students in a cohort. Somewhat similar, in the entertainment industry, a spectator's experience is affected by the stadium atmosphere jointly created with other attendees. Certainly more important, in the healthcare industry, waiting patients are likely to experience delayed access to care as patient NSB reduces the general healthcare effectiveness by effectively lowering the number of patients that can be seen by a doctor (e.g., Stubbs et al., 2012).

3.3 | No-shows may suffer in the long-term

For the no-show him-/herself, NSB is more likely to result in disadvantages in the long-term. For instance, in the education industry, where truancy is a synonym for NSB, truant students apparently perform worse than regular attendants (e.g., Aucejo & Romano, 2016), are at a higher risk for school dropouts (Robins & Ratcliff, 1980), and more likely to develop aggressive and violent

behavior (McCord & Enslinger, 1997). While student NSB marks an educational interruption, in the healthcare industry, in turn, patient NSB might negatively impact patient outcomes as it affects the continuity of care (Schechtman et al., 2008).

4 | METHODOLOGICAL APPROACH

To mitigate the potential challenges arising from individual NSB described above, it is important to understand better both the antecedents and countermeasures and their robustness across industries. Thus, in this manuscript, we synthesize the current state of empirical research on NSB by applying a systematic and interdisciplinary approach.

In essence, while reviewing the previous empirical literature on NSB, we follow an established methodological approach introduced by Tranfield et al. (2003). Thus, our systematic review comprises four subsequent steps: First, research identification; second, study selection; third, study quality assessment; and, fourth, data extraction and synthesis. Below, we report on the details of every one of these four steps.

4.1 | Research identification

To identify the relevant literature on NSB, we searched the EBSCO database multiple times, last on January 15, 2022. More precisely, in a first step, we searched in the titles of publications for the words “absenteeism”, “missed appointment(s)”, “no show(s)”, “nonattendance”, and “non attendance(s)”.² In sum, our search yielded a total of 111.769 initial results. In a second step, we then limited the search results to only those articles (1) published in academic, (2) peer-reviewed journals, that were (3) written in English. In line with previous attempts (e.g., Dantas et al., 2018), we only considered those manuscripts published in peer-reviewed academic journals to ensure a minimum level of quality.³ Also, as it is the quasi-standard when conducting literature reviews, we assume a significant shift towards English publications in recent years to ensure that we cover the most relevant research (e.g., Galandi et al., 2006). As a first intermediate result, a total of 11.920 articles in our temporary data set met all three criteria. In the next step, we then imported all these 11.920 articles into EndNoteX9, that is, an established software that facilitates the management of references. On the basis of that, we removed all duplicates which reduced the number of articles to 4.082 (cf., Table 1). Subsequently, in those cases where the title of an article included more than one of the keywords mentioned above, we allocated the article to the keyword first mentioned in the title.

In Figure 1, we document the distribution of all 4.082 manuscripts in our temporary data set over time; that is, before 1900 until 2021. As the number of publications on NSB seems to have drastically increased more recently, and because we believe that the more important findings generated in the late 20th century are most likely to be both extended and replicated in this more recent empirical work, we, then, decided to include only those 2.577 articles, roughly 60% of all identified articles in our temporary data set, that were published in this millennium. To summarize, in Table 1, we provide a concise overview of the research identification process by keywords.

We then made two noteworthy changes to our temporary data set. First, because Dantas and her colleagues had published a systematic literature review on the antecedents of patient NSB that includes research published between January 1980 and July 2016 (Dantas et al., 2018),⁴ we

TABLE 1 Identification of relevant literature

Keyword	# of articles	# thereof published in academic journals	# thereof peer-reviewed	# thereof in English	# excl. duplications	thereof published 2000–2021
“absentecism”	32.689	13.096	9.129	8.199	2.901	1.618
“missed appointment(s)”	2.051	617	428	416	143	121
“no show(s)”	70.931	2.288	1.463	1.412	469	389
“nonattendance”	929	616	454	427	131	101
“non attendance(s)”	5.169	2.602	1.763	1.466	438	348
Total	111.769	19.219	13.237	11.920	4.082	2.577

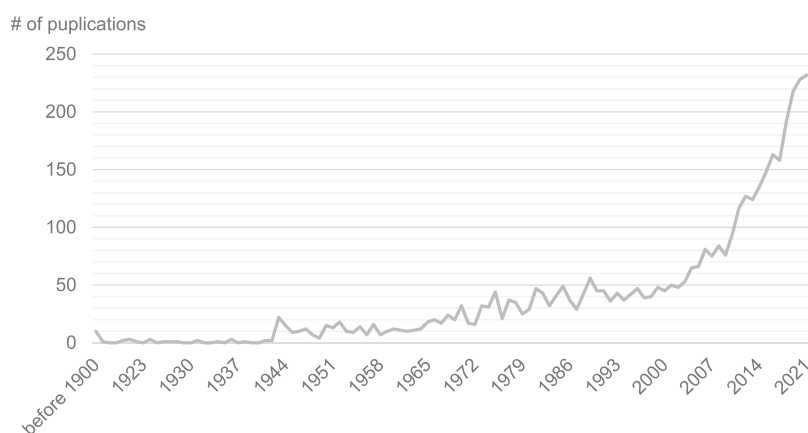


FIGURE 1 Number of published articles before 1900 until end of 2021

excluded a total of 211 articles examining patient NSB in the healthcare industry, all of which were published before August 2016.⁵ Second, because a few articles were not accessible for us, we excluded a total of 42 manuscripts that we requested directly from the authors unsuccessfully. As such, we considered a total of 2,324 manuscripts for eligibility testing.

4.2 | Study selection

In our second step, we reviewed titles and abstracts of all remaining 2,324 manuscripts. As a result of this study selection process (c.f., Tranfield et al., 2003), we excluded another 1,824 manuscripts (c.f., Figure 2).

In total, manuscripts had to fulfill the five criteria explained in more detail below to be eligible for our literature sample/dataset. Accordingly, verifying manuscript eligibility following all these five criteria and in the same order for each manuscript, we excluded a manuscript whenever it failed to fulfill the given criteria. As such, we excluded each manuscript for one specific reason, that is, the exclusion criteria identified first (and we then refrained from further analysis in that case). However, this does not necessarily mean that these manuscripts fail only to meet this specific requirement. Also, perhaps needless to say, in case of doubt, for instance, about methodological aspects that were not immediately evident from either reading the abstract or the title, we kept a manuscript, reading it in full.

First, to be considered for our systematic review, in the manuscript, the unit of analysis must capture either an individual's behavior or an aggregate thereof. As such, we excluded, for instance, manuscripts assessing attribute behavior (e.g., Scarpa et al., 2009) or governmental decision-making. For instance, those authors assessing such governmental decision-making have focused on a non-participation of a certain country in a particular event or in an international organization (e.g., Atwell, 2015). As a result, we excluded 131 manuscripts because they failed to meet this first eligibility criteria.

Second, the article must deploy an empirical methodology, utilizing an appropriate statistical method to identify (and evaluate) a potential relationship between an independent and a dependent variable. Here, we excluded, for example, purely qualitative studies (e.g., Leggat & Smith, 2009), literature reviews (e.g., Hull & Ambrose, 2011), and studies where the methodological

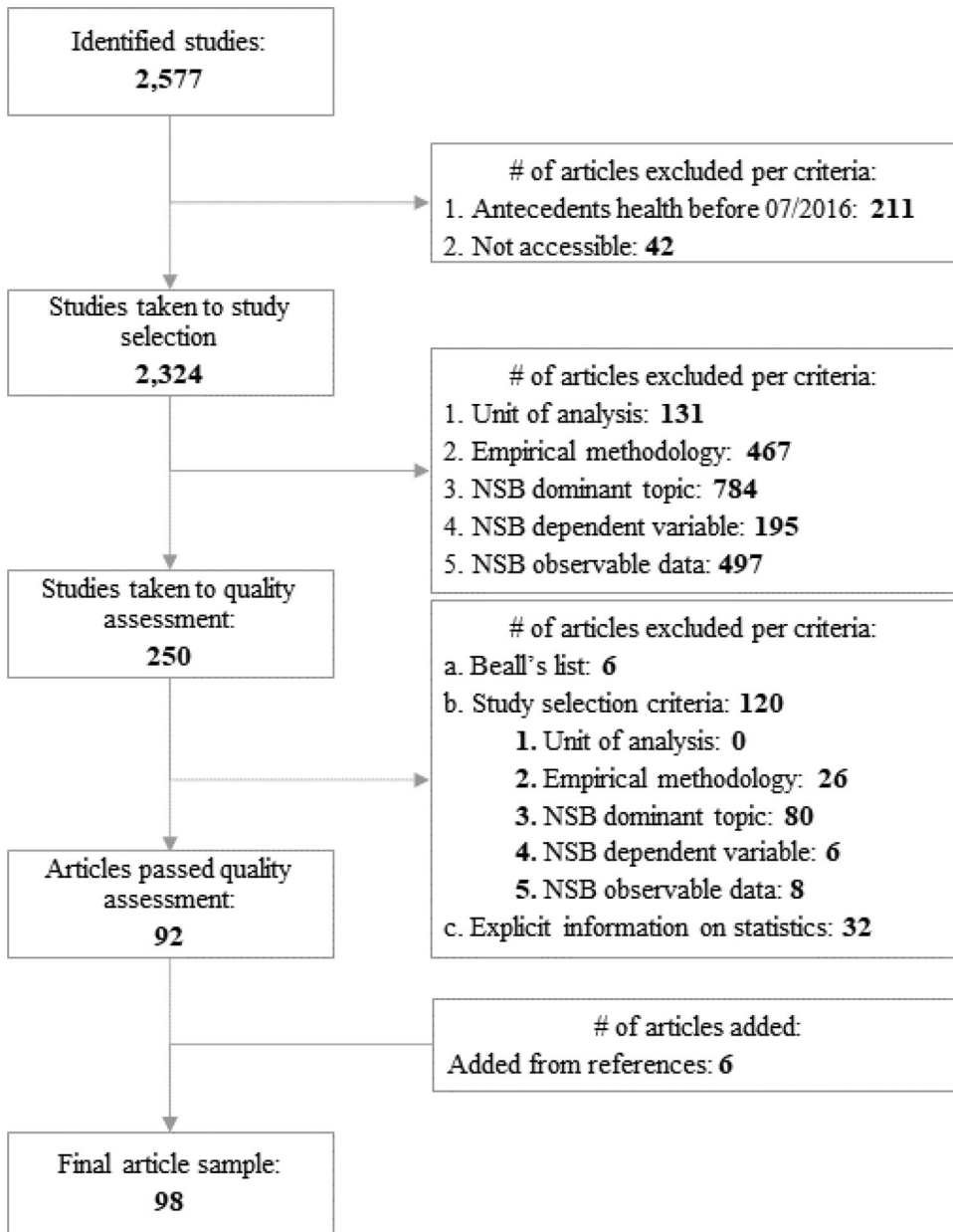


FIGURE 2 Study selection and quality assessment

approach was not described in the necessary detail (Kunje, 2008). As a result, we excluded 467 manuscripts because they failed to meet this second eligibility criteria.

Third, in the manuscript, NSB must be the dominant and systematically addressed topic.⁶ As per our definition presented above, NSB is observed if individuals with a scheduled appointment/commitment (e.g., a doctors' appointment, a flight ticket, a school registration) fail to show-up without prior notice (c.f., Section 2). Consequently, in this step, we excluded, for example, those manuscripts considering (late) cancellations as no-shows (e.g., Fiorillo et al., 2018) as

well as studies where individuals did not have an appointment at all (e.g., Listl, 2016). As a result, we excluded 784 manuscripts because they failed to meet this third eligibility criteria.

Fourth, in addition to the previous step three, in the manuscript, NSB must be treated as the dependent variable. To comply with this criterion, we excluded all studies assessing the effects of no-shows (e.g., Moore et al., 2001). As a result, we excluded 195 manuscripts because they failed to meet this fourth eligibility criteria.

Fifth, as we were interested in NSB rather than behavioral intentions or memories of behavior, the dependent variable must be capturing such behavior as generated through observable data. In fact, on a more general note, previous research has long found that individuals, in particular, those with higher absenteeism/NSRs, tend to significantly underestimate such defective behavior (e.g., Karg & McDonald, 2011). Accordingly, we excluded studies using, for instance, survey data (e.g., Sobolewska et al., 2019). In contrast, most studies in our data set generate data with the help of (electronic) records employed by a certain service provider, for example, medical records (e.g., Krishnamurthy et al., 2016), or, in the entertainment and sports industry, a facility access system (e.g., Schreyer & Torgler, 2021). As a result, we excluded 497 manuscripts because they failed to meet this last eligibility criteria.

In Figure 2, we provide a detailed flow chart summarizing both the study selection process and the subsequent quality assessment. As can be seen from this Figure, a total of 250 articles fulfilled all of our five eligibility criteria at first glance.

4.3 | Study quality assessment

We then fully read the remaining 250 articles, evaluating them across three additional criteria. First, to ensure a minimum level of quality and avoid the inclusion of predatory journals, we checked whether the respective journal appeared on Beall's (2012) list.⁷ Second, we once more verified that all articles fully met our five eligibility criteria. Third, we controlled whether information on statistical tests/methods and the corresponding results were made explicit. In contrast, if either of these was missing, we excluded the article from our data set.

In conclusion, a total of 92 articles remained, thus building the basis for our literature review. However, to not omit relevant studies, we then screened the references of these articles and, as a result, added six additional manuscripts to our dataset. All these six articles passed our inclusion criteria, although their titles did not contain any of the words that we had initially searched for.

As such, our final sample consists of 98 articles (see Figure 2);⁸ that is, 41 studies on the antecedents of NSB and another 57 studies exploring the potential of countermeasures to reduce such behavior.⁹

4.4 | Data extraction and synthesis

In the last step of our methodological approach, we then retrieved, and stored, information for each article, including general information (i.e., on the title, authors, journal, publisher, publication year) as well as descriptive information on the methodological approach (i.e., on the number of specificities of the countries/regions included in the study, the methodology, the unit of observation, the source of the no-show data, the size of the study population, the different independent variables, the empirical findings). In sum, we thus initially stored information on 39 different aspects.

5 | ANALYSIS, SYNTHESIS, AND DISCUSSION

Below, we synthesize the results from our analysis of the previous no-show research, thereby employing a five-step approach. First, to make an initial assessment of whether the authors active in the different fields analyzing NSB have interacted, we conduct an initial scoping of the literature in our data sample. Second, to better understand the effect and, more importantly, the robustness of the many potential antecedents across different industries/sectors, we synthesize the results from those 41 studies analyzing the antecedents of NSB. Third, however, primarily to offer an avenue for future NSB research, we not only synthesize these previous results but also discuss what has not yet been addressed in the empirical literature. Fourth, to offer another perspective on the previous literature, we then briefly discuss how NSB research can be a laboratory to test otherwise unrelated (economic) ideas. Finally, fifth, we synthesize and discuss the previous results from those 57 studies in our data sample, analyzing the effects of potential countermeasures to reduce NSB.

5.1 | No-show behavior research is not yet an interdisciplinary field of research

By initially scoping the empirical literature in our data set, we first note that our sample contains a total of 98 studies published in 86 different journals, with 76 of these journals appearing only once on our list. More specifically, we count four contributions in the *Journal of the American College of Radiology* (e.g., Mieloszyk et al., 2019), and two studies in *Applied Economics* (e.g., Schreyer & Torgler, 2021), *Applied Economics Letters* (e.g., Frevel & Schreyer, 2019), *Australasian Journal of Information Systems* (e.g., Bellucci et al., 2017), *BMC Health Services Research* (e.g., Wolff et al., 2019), *Danish Medical Journal* (e.g., Wolthers, 2019), *Endoscopy* (e.g., Adams et al., 2004), *Family medicine* (e.g., Starnes et al., 2019), *International Journal of Consumer Studies* (e.g., Milne, 2010), and *New Zealand Medical Journal* (e.g., Reti, 2003) each.

While this diversity might initially signal a certain breadth in the more recent research on NSB, most of these 98 contributions stem from only one particular subject area – *Medicine*, excluding related areas such as *Dentistry*. More specifically, by classifying all 86 journals in our sample according to the well-established Scimago Journal & Country Rank (SJR),¹⁰ we count that 71 of them fell in the subject area of *Medicine*, though not all of them exclusively,¹¹ followed by the three subject areas *Business, Management and Accounting* (9), *Social Sciences* (6), and *Nursing* (6).

After all, five journals fall into the subject area *Economics, Econometrics, and Finance*. Notably, though, as ten journals have published more than one manuscript on NSB, this subject area ranks third in terms of total contributions (8), clearly falling behind *Medicine* (80) and, to a lesser degree, *Business, Management, and Accounting* (11).

Naturally, empirical studies on patient NSB, therefore, built an anchor in our understanding of NSB (c.f., Table A1 and A2 in the Appendix), with only a few additional studies exploring passenger (e.g., Garrow & Koppelman, 2004a) and spectator (e.g., Schreyer et al., 2019) NSB. In contrast, the more recent literature is mostly shy on NSB in organizations (e.g., employees, job interviewees, meetings) or restaurants, despite increasing anecdotal evidence on their increase – perhaps because such data is typically scarce and, thus, hard to obtain.

Perhaps surprisingly, also reflecting the literature stream's strong roots in the broader subject category medicine, to some degree, we further note that an exchange of knowledge between

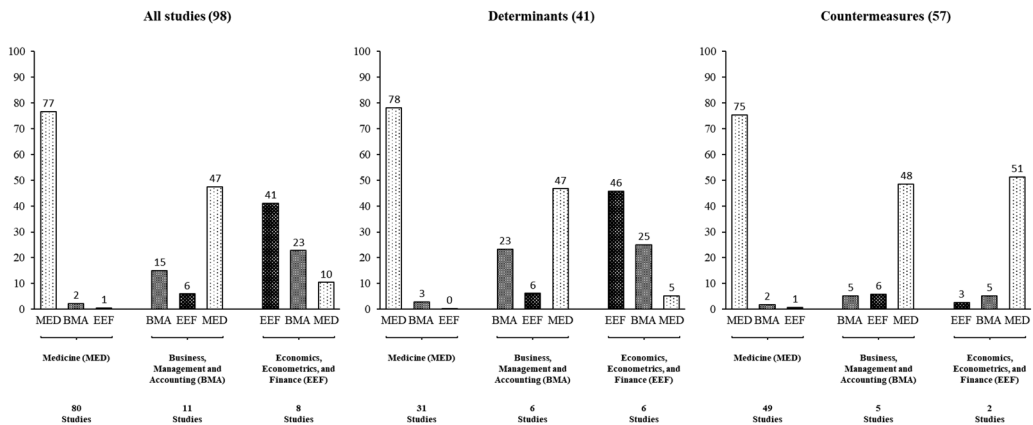


FIGURE 3 Indicative citation analysis. Relative share of references relating to same-/different-subject-area journals for those articles published in journals that fall in the top three subject areas (i.e., BMA, EEF, MED). *Business, Management and Accounting (BMA)*; *Economics, Econometrics, and Finance (EEF)*; *Medicine (MED)*

authors operating in the different fields is limited at best. That is, based on a simple bibliometric analysis, we observe that those authors publishing in journals that fall into the subject area of medicine almost exclusively refer to literature originating from the very same domain. More specifically, we count that roughly three out of four references in these articles refer to another article published in a same-subject-area journal, with only about 5 and 4% of all references relating to the two subject areas, *Nursing* and *Social Sciences*, the subject areas on the ranks, respectively. In contrast, only circa 15 and 41% of all references in those articles published in a journal that falls into the subject areas *Business, Management, and Accounting*, and *Economics, Econometrics, and Finance*, respectively, refer to an article in a same-subject-area journal. Interestingly, this does, however, not necessarily mean that NSB research in these two fields, in particular, is quasi-automatically informed by the extant literature on patient NSB. Quite the opposite, we observe that those authors of articles published in an *Economics, Econometrics, and Finance* journal, in particular, only occasionally refer to this extant stream of the NSB literature, even though it is already comparatively well developed.

In Figure 3, we illustrate the relative share of references relating to same-/different-subject-area journals for those articles published in journals that fall in the top three subject areas, specifically indicating the percentage of references relating to the subject area of *Medicine*. As can be seen from this figure, the aforementioned patterns are mainly robust across studies on the two different study types in our sample, that is, those studies (1) analyzing the antecedents of NSB, and (2) those studies that center on potential countermeasures.

5.2 | Antecedents of no-show behavior might be contextual, to some degree

Our subset of studies analyzing the antecedents of NSB contains 41 manuscripts from three different industries; that is, the entertainment and sports (five contributions; e.g., Schreyer & Torgler, 2021), the healthcare (34; e.g., Blæhr et al., 2016),¹² and the transportation industry (two; e.g., Garrow & Koppelman, 2004b; cf., Table A1 in the Appendix). As such, a natural explanation for the

evident lack of interdisciplinarity in these largely distinct streams in the NSB literature could arise from the assumption that such behavior might not always be easy to compare across the different industries. In other words, a sports economist interested in analyzing spectator NSB might conclude that patient and spectator behavior is very (or at least too) different, thus refraining from an interdisciplinary approach. Similarly, it most certainly makes a difference whether a scheduled appointment effectively means surgery or travel.

Interestingly, although the potential antecedents of NSB are manifold and, in fact, not always neatly comparable across these three industries, there are still a few commonalities across the different industries, most of which relate to product characteristics and the potential opportunity costs arising from attendance. Among the ladder, for instance, we observe a robust increase in the NSR for German football matches played during the week (e.g., Schreyer, 2019), that is, in the late afternoon or evening, which might complicate the journey for fans with work commitments, largely reflective of passenger NSB, which increases for both early and late flights, though not necessarily with patient NSB; that is, albeit some studies (e.g., Bickler, 1985; Huang & Hanauer, 2014; Storrs et al., 2016) suggest higher NSRs on both Mondays and Fridays. Similarly, we note an important role of the expected product quality among both spectators (e.g., with regard to away team characteristics) and passengers (e.g., travel amenities). Also, while potentially working in contrary ways, decision-making is likely to be affected by the price in all industries, while no-show habits are evident among both patients and spectators (e.g., Schreyer & Torgler, 2021). Somewhat similarly, we also observe that an increase in lead times is associated with an increase in the probability of patient NSB, a pattern that somewhat resembles the higher NSRs among season ticket holders, whose appointment agreement and appointment often lie very far apart. In other words, individuals may forget or, in the entertainment and sports industry, lose interest in keeping an appointment over time.

However, we also note differences across, sometimes even within sectors that suggest that the antecedents of NSB might, in fact, be contextual, to some degree. For instance, as can be seen from Table 2, we observe no robust negative relationship between extreme weather (e.g., precipitation) and NSB in the healthcare industry, a relationship that seems more pronounced in the sports industry. Somewhat similarly, in the entertainment and sports industry, we note that most antecedents that help explain spectator NSB in one league, fail to explain such behavior in another league (e.g., Schreyer et al., 2019).

On a more general note, however, comparing the antecedents of NSB across the different industries in the necessary detail is challenging, primarily because most authors have exploited quite heterogeneous data samples. For instance, while authors analyzing patient NSB tend to analyze individual-level data, those authors exploring patient and spectator NSB have centered mainly on analyzing aggregated-level data over many individuals, thus omitting information on a no-show's socio-demographic profile, among others. While such information might be hard to obtain, the resulting methodological choices, if any, seem to prevent further learning from each other, which might help explain the lack of interdisciplinarity described above. The evident differences in the services offered across the industries further complicate the analysis of product aspects, among others, which are largely absent from the otherwise rich literature on patient NSB.

5.2.1 | Antecedents of football spectator no-show behavior

All five studies in our sample, most of them modelling German Bundesliga football, point to an important role of product characteristics in shaping spectator NSB. More precisely, as the host

TABLE 2 Overview determinants of patient no-show behavior

Determinants	Subset I		Subset II		Superset		Subset I		Subset II		Superset		Subset I		Subset II		Superset		Subset I		Subset II		Superset	
	Dantas et al. (2018) 01/1980 until 07/2016		08/2016 until 12/2021		01/1980 until 12/2021		105 studies		34 additional studies		139 studies		105 studies		34 additional studies		139 studies		105 studies		34 additional studies		139 studies	
	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a	Insig.	Sign. ^a
Socio-economic																								
Age	44	55	5	23	49	78	44	55	5	23	49	78	44	55	5	23	49	78	44	55	5	23	49	78
Gender (male)	70	20	16	9	86	29	70	20	16	9	86	29	70	20	16	9	86	29	70	20	16	9	86	29
Race minority	13	17	2	13	15	30	13	17	2	13	15	30	13	17	2	13	15	30	13	17	2	13	15	30
Ethnicity	10	11	3	3	13	14	10	11	3	3	13	14	10	11	3	3	13	14	10	11	3	3	13	14
Married	13	8	-	2	13	10	13	8	-	2	13	10	13	8	-	2	13	10	13	8	-	2	13	10
Educational level	12	3	-	2	12	5	12	3	-	2	12	5	12	3	-	2	12	5	12	3	-	2	12	5
Socioeconomic status	4	7	-	8	4	15	4	7	-	8	4	15	4	7	-	8	4	15	4	7	-	8	4	15
Language barriers	6	5	4	3	10	8	6	5	4	3	10	8	6	5	4	3	10	8	6	5	4	3	10	8
Employment	7	4	2	-	9	4	7	4	2	-	9	4	7	4	2	-	9	4	7	4	2	-	9	4
Citizenship (foreign)	3	2	-	1	3	3	3	2	-	1	3	3	3	2	-	1	3	3	3	2	-	1	3	3
Religion (Christianity)	3	1	1	1	4	2	3	1	1	1	4	2	3	1	1	1	4	2	3	1	1	1	4	2
Residence (Urban)	1	3	-	-	1	3	1	3	-	-	1	3	1	3	-	-	1	3	1	3	-	-	1	3
Transportation to/from clinic	2	2	1	-	3	2	2	2	1	-	3	2	2	2	1	-	3	2	2	2	1	-	3	2
Family support	-	2	-	-	-	2	-	2	-	-	-	2	-	2	-	-	-	2	-	2	-	-	-	2
Residency status	2	-	-	-	2	-	2	-	-	-	2	-	2	-	-	-	2	-	2	-	-	-	-	2
Early birth in the year	-	1	-	-	-	1	-	1	-	-	-	1	-	1	-	-	-	1	-	1	-	-	-	1
Siblings	-	-	1	-	1	-	-	-	1	-	1	-	-	-	1	-	1	-	-	-	1	-	-	-

(Continues)

TABLE 2 (Continued)

	Subset I		Subset II		Superset			
	Dantas et al. (2018) until 07/2016	01/1980	08/2016 until 12/2021	01/1980 until 12/2021	01/1980 until 12/2021	01/1980 until 12/2021	01/1980 until 12/2021	01/1980 until 12/2021
	105 studies		34 additional studies	139 studies				
Health status								
Health insurance/ Form of payment	15	24	1	19	16	43	31	12
Clinical diagnosis	8	10	3	-	11	10	10	-
Substance abuse	4	9	-	1	4	10	10	-
Medical history	4 ^b	8 ^b	2	10	6	18	8	10
Symptoms	-	5	-	-	-	5	2	3
Use of medication	1	4	-	-	1	4	3	1
Hospital admissions	2	1	-	-	2	1	1	-
Family physician	1	-	-	-	1	-	-	-
Scheduling								
Lead time	9 ^c	40 ^c	-	16	9	56	51	4
Appointment time (afternoon)	19	17	6	7	25	25	17	7
Day of the week	15	15 ^d	4	6	19	21	13	4
Prior no-show history	2	15	-	7	2	22	22	-
Appointment month	11	7	2	1	13	8	6	1
Season (winter)	6	4	5	-	11	4	3	1

(Continues)

TABLE 2 (Continued)

	Subset I		Subset II		Superset				
	Dantas et al. (2018) 01/1980 until 07/2016		08/2016 until 12/2021		01/1980 until 12/2021				
	105 studies		34 additional studies	139 studies					
Number of prev. scheduled visits	2	7	-	2	2	9	4	5	-
Weather: Precipitation	6	1	1	3	7	4	4	-	-
Weather: Temperature	3	-	-	3	3	3	1	1	1
Year of appointment	1	3	1	-	2	3	1	2	-
Days since last appointment	1	1	-	-	1	1	-	1	-
Holiday	-	-	1	1	1	1	1	-	-
Online scheduling	-	-	-	1	-	1	-	1	-
Previous rescheduling									
Clinic initiated	-	-	-	1	-	1	1	-	-
Patient initiated	-	-	-	1	-	1	-	1	-
Appointment characteristics									
Distance	13	20	5	3	18	23	16	4	2
Type of visit (follow-up)	9	11	2	3	11	14	7	7	-
Source of referral	8	11	1	3	9	14	10	4	-
Provider type	6	9	1	3	7	12	2	10	-
Type of procedure	4	5	1	6	5	11	8	3	-
Specialty	-	5	1	11	1	16	12	4	-
Clinic characteristics	5	2	-	-	5	2	2	-	-
Telephone number recorded	1	3	-	-	1	3	-	3	-
Referral method	2	1	-	-	2	1	-	1	-
Provider gender	2	-	1	-	3	-	-	-	-
Provider age	-	1	-	-	-	1	1	-	-
Drug screening in previous visit	-	-	-	1	-	1	1	-	-

Abbreviations and notes: Insignif. Significant (Sign.); Unspecified (Unspec.) ^aSignificant at least at the 0.05 level, ^bDantas et al. (2018) mention 3 insignificant and 9 significant studies, however we find no significant influence in Daniels & Jung (2009); ^cDantas et al. (2018) mention 8 insignificant and 41 significant studies, however, we find no significant influence in Kalb et al. (2012); ^dDantas et al. (2018) mention 14 significant studies, however in their discussion they include an additional paper that was not mentioned in their table (Adams et al., 2004).

cannot offer a product without the visiting team in sports, these early results suggest that away team characteristics are essential in shaping a ticket holder's decision to attend a match (c.f., Schreyer, 2021a). For instance, the authors point towards an important role of the visiting team's geographical proximity (e.g., Schreyer & Däuper, 2018), their past history, commonly referred to as tradition, (e.g., Schreyer et al., 2019), and the accumulated talent (Schreyer, 2019) in explaining football spectator NSB. In contrast, home team characteristics, which tend to only vary slightly over a season, seem largely negligible (Schreyer, 2019), although there exists a positive promotion effect in the first year.¹³

Intriguingly, although the authors of four of these five studies, all of them exploiting Bundesliga data, have refrained from exploring individual spectator data, that is, data which would allow to explore otherwise interesting factors such as the ticketing price or the role of socio-demographics in explaining spectator NSB, first evidence nevertheless suggests that spectator NSB is more prominent among a Bundesliga club's season ticket holders as compared to match-day ticket holders (c.f., Schreyer, 2019). Consequently, it is, perhaps, no surprise that Schreyer and Torgler (2021), analyzing individual NSB at Swiss football club FC Basel between 2013 and 2016, note a significant higher NSR among the club's season ticket holders than among matchday ticket holders, also documenting a positive association between free tickets and subsequent NSB.

Somewhat similarly, the opportunity costs arising from attending a match in the stadium seem to play an important role. That is, most authors note an increase in spectator NSB for mid-week matches, those matches played on a matchday with extreme temperatures, and also mid-season games (e.g., Schreyer, 2019). Further, spectators seem to adapt their behavior in the aftermath of exogenous shocks in the short term (Frevel & Schreyer, 2019).

Somewhat surprisingly, however, there seem to exist significant differences in the antecedents of football spectator NSB across leagues, that is, even within the same football market, that call for future robustness checks in alternative markets (Schreyer et al., 2019). For instance, although Schreyer et al. (2019) observe a tendentially robust and positive geographical derby effect in Bundesliga 2, in this particular environment NSB was neither significantly higher for those games scheduled on mid-week games nor those played on days with extreme temperatures. Similarly, we note some significant differences in the role of opportunity costs in explaining NSB in Germany and Switzerland, most notably an insignificant midweek effect in Basel (c.f., Schreyer & Torgler, 2021), that, however, might dissolve as more data from the Swiss league becomes available.

5.2.2 | Antecedents of passenger no-show behavior

As with football spectator NSB, passenger NSB in the airline transportation industry seems to be shaped by product characteristics and the related opportunity costs arising from traveling. It is, however, noteworthy that our subset only contains two such studies modeling passenger NSB (Garrow & Koppelman, 2004a, 2004b), both published more than 15 years ago. As such, it remains open for discussion whether the observed effects have withstood the test of time.

Product-wise, these previous research suggest that maintaining a frequent flyer status, traveling in high prices classes (i.e., in business/first class), and traveling in groups reduces passenger NSB (e.g., Garrow & Koppelman, 2004a). As such, it seems likely that it is primarily the ticket price and, somewhat related, also travel amenities (e.g., priority booking, lounge access) that shape passenger decision-making. Intriguingly, the associated appreciation for operational efficiency is also largely reflected in the perhaps anachronistic observation that those passengers holding an e-ticket were found to be more likely to take a flight (e.g., Garrow & Koppelman, 2004b).¹⁴

Concerning the schedule of the flight, most probably an indicator of the opportunity costs arising from (business) traveling, both previous studies found the day of the week to be insignificant in determining NSB. In contrast, however, the time of the day was a significant predictor of NSB, meaning that passengers were more likely to omit both early morning flights (before 9:00 a.m.) and late night flights (after 7:00 p.m.; e.g., Garrow & Koppelman, 2004a).

Somewhat related, these previous studies, also observed significantly higher NSRs among passengers scheduled for inbound flights than for those on outbound flights. Interestingly, there are several potential explanations for this observation, one of which, once more links back to the already discussed, here, though, initially counter-intuitive role of the ticket price, as irrationalities in the carrier's pricing mechanism may motivate passengers to purchase two sets of tickets for the planned trip, only to then use the outbound ticket of each set (e.g., Garrow & Koppelman, 2004b). Naturally, in this case, passengers on the accompanying inbound flights are no-shows.

5.2.3 | Antecedents of patient no-show behavior

In Table 2, we present an overview of the potential determinants of patient NSB. More precisely, as can be seen from this table, we report the effects of factors such as socio-economic information, health status, and scheduling/appointment details, from, first, a previous literature review focusing on patient NSB conducted by Dantas et al. (2018), 34 additional manuscripts published after July 2016 (cf., Section 4.1), and, most importantly, a new superset combining the information from both data subsets.

In sum, those 34 studies in our subset largely, but not entirely, amplify the previous results by Dantas and her co-authors (2018), generated from analyzing 105 empirical studies. For instance, exploring the role of socio-demographic factors in shaping patient NSB, we note a tendency for a negative role of a patient's age in predicting NSB, implying that NSB is more likely to occur among young patients. In contrast, the patient's gender seems to be neglectable, whereas patients from a minority group are mostly found to be more likely to omit attendance. Apart from these initial factors, our understanding seems to be rudimentary at best as results seem to be rather balanced. Intriguingly, such ambiguities also prevail as we summarize the role of a patient's health status, the potential opportunity costs arising from a scheduled appointment, and, last but not least, specific appointment characteristics below.

Socio-economic antecedents

In sum, we summarize findings on 17 different socio-economic factors, most of which only attracted occasional interest among those colleagues modeling patient NSB. Perhaps not surprisingly, the potential role of both age (127 studies) and gender (115) has attracted the most attention, followed, with some distance, by similarly traditional socio-demographic information such as on the patient's race (45) and/or ethnicity (27), marital status (23), socioeconomic status (19), and the education level (17). Evidence on other factors is less pronounced.

As can be seen from Table 2, a patient's age is likely to significantly affect NSB although evidence is mixed. Intriguingly, though, if a study finds a significant effect, this effect tends to be overwhelmingly negative, indicating that NSB is more likely to occur among young patients. Unfortunately, most of these studies, however, refrain from controlling for a potential non-linearity in the relationship between age and NSB as indicated by a subset of eight studies in our superset. Here, we observe some evidence for a relationship in the form of an inverted u-shape, indicating that the probability of NSB is, in fact, likely to increase as the patient ages, but only

to a certain point after which the effect reverses (e.g., Bellucci et al., 2017). Somewhat more precisely, previous studies have located this turning point somewhere between 20 (Harvey et al., 2017) and 64 years (Ratmansky et al., 2017), once more leaving room for more nuanced research in the future; that is, research that refrains from exploring age by adding age clusters rather than metric information (e.g., Chua & Chow, 2019), comparing mere medians (e.g., Briatore et al., 2020), or even excluding certain age groups (e.g., Bell et al., 2020).

Unlike the role of age, the role of gender in explaining NSB seems to be rather clear, as most studies document no significant gender effect. In addition, we note a modest tendency, indicating that patients from racial minority groups are more likely to omit attendance (e.g., Chua & Chow, 2019), while the patient's educational background seems to play no role in predicting patient NSB (e.g., Nour El-Din et al., 2008). In contrast, the potential effect of additional socioeconomic factors is less pronounced, almost mixed throughout. For instance, we observe rather balanced outcomes for both ethnicity and marital status that do not allow for a final verdict, as is imminent for most additional factors.

Health status

Intriguingly, evidence on the effect of a patient's health status in explaining patient NSB is similarly ambiguous as most socioeconomic factors, perhaps with the exception of an individual's substance abuse, which is predominantly associated with an increase in NSB (e.g., Daniels & Jung, 2009). Apart from that, about two out of three studies document an important role of a patient's health insurance (e.g., Kaplan-Lewis & Percac-Lima, 2013) though, again, with partly contradicting findings. One potential explanation might point to the need for more nuanced exploration. That is, in the US, for instance, Medicaid patients were found to be significantly more likely to no-show than Medicare patients (e.g., Hunter et al., 2019), which might ultimately be grounded in different socioeconomic characteristics among the insured, resulting in long travel distances for Medicaid patients (e.g., Weiner et al., 2009), among others.

Scheduling effects and related appointment characteristics

Most studies suggest an important role in how an appointment is scheduled in explaining subsequent patient NSB. In particular, we note a consistent role of the lead time, that is, the time span between the scheduling of the appointment and the subsequent appointment, indicating that an increase in the lead time is associated with an increase in NSB (e.g., Guzek et al., 2015). In fact, most previous survey research has frequently found that one potential explanation for this relationship might be simple forgetfulness (e.g., Bueno et al., 2020), thus applying different variations of a reminder to reduce NSB. Naturally, an alternative would be to reduce lead times.

Unlike in both the entertainment and the travel industry, we observe mixed findings on the role of most further factors, including the appointment day and time slot, among others. Interestingly, in Asia, no-shows increase with rising precipitation and temperature (Tsai et al., 2019), while the influence of weather on no-shows in both North and South America, as well as in Europe remains unclear (e.g., Giunta et al., 2013). In addition, we observe an interesting effect of emerging no-show habits, indicating that the no-show probability increases for those patients that have omitted attendance before (e.g., Collins et al., 2003).

As with previous factors, a consensus on related appointment characteristics is surprisingly rare. However, most studies document a positive influence of distance (i.e., distance between the patients' home and the clinic; e.g., Mander et al., 2018), this is especially prevalent in Africa where transportation may not always be as easy as on more developed continents (e.g., Mbada et al., 2013). Lastly, the majority of studies find the type of visit (i.e., follow-up versus new patient) to influence NSB. Specifically, in Asia, follow-up patients seem to be less likely to no-show compared

to new patients. In contrast, most studies finding a significant influence in Europe and North and South America observe follow-up patients to be more likely to no-show. While in some cases doctor appointments may lose their urgency for follow-up patients, it seems like Asian patients are especially mindful of attending their follow-up appointments, nevertheless.

5.3 | Many antecedents are still not yet explored (or under-researched)

Although those authors exploring NSB have already begun exploring numerous potential antecedents across the different industries, most such studies have centered on convenient socio-economic predictors, most notably age and gender, factors that relate to the arising opportunity costs from keeping a scheduled appointment, and, less so, specific service or product characteristics. In contrast, our understanding of whether, and if so how, socio-psychological constructs (e.g., attitudes, emotions, or personality characteristics) might help explain and, consequently, reduce NSB is limited. For instance, a better understanding of whether a patient's fears are associated with patient NSB might help medical staff reduce such behavior by framing information differently.

A natural explanation for this absence of socio-psychological research could result from the apparent limitations in the study design choices by those authors exploiting observational data generated in the business practice. Analyzing what was already out there, primarily, these authors have largely, and conveniently, refrained from adding additional data points (e.g., through additional survey questions) – a fact that might also explain the surprising variance in the measurement of certain dependent variables, most notably age. Somewhat differently, most authors exploring NSB outside the healthcare industry have refrained mainly from analyzing individual data at all (e.g., Schreyer & Däuper, 2018), perhaps, because such data is often scarce or hard to obtain. As such, while these previous studies are certainly not without their merits, future NSB research might benefit significantly from moving towards an analysis of the socio-psychological antecedents of such behavior on the individual level, for instance, by combining observational and survey data.

5.4 | No-show research might help to understand economic behavior better

Although not a typical pattern in the literature, it is interesting to note that NSB research might also be a laboratory to test otherwise unrelated (economic) ideas. For instance, Frevel and Schreyer (2019) find that German football spectator NSB increases in the aftermath of the Paris attacks of November 13, 2015, providing insights into the behavioral responses to terrorist attacks that otherwise would have been difficult to identify (e.g., through survey research). As such, while sports data, in general, has been increasingly employed as a natural lab to test economic hypotheses (e.g., Bar-Eli et al., 2020), the analysis of spectator NSB, in particular, might offer additional insights beyond mere spectator decision-making.

5.5 | Mechanisms of countermeasures are not yet fully understood

Our subset of studies analyzing the potential measures to reduce NSB contains 57 manuscripts from three different industries. However, once more, the vast majority of all those empirical

studies were conducted in the health industry (53 studies), with only three exploring measures in the education and one in the research industry. Interestingly, these 57 contributions were generated in various markets, that is, in the United States (23), Europe (22), Australia (4), Saudi Arabia (2), Brazil, Canada, Hong Kong, Israel, Malaysia, and New Zealand (one each), and should thus add to our understanding of the cultural robustness of the observed effects.

Below, we summarize these findings grouped by the kind of measure that was evaluated. More precisely, we differentiate between different forms of reminders, customer-centricity initiatives, interventions, and incentive and punishment mechanisms.

Intriguingly, we note that reminders are most likely to help reduce NSB, perhaps, because they are the most natural measure to solve forgetfulness, that is, the most common natural explanation for such behavior (e.g., Herrick et al, 1994). Although this might be true for unpleasant or unwelcomed services that are scheduled long before an appointment is due (e.g., an appointment with the dentist), it remains open whether the mechanism is also effective when forgetfulness might be less likely due to extensive media coverage and certain regularities (e.g., in the entertainment and sports industry; c.f., Schreyer et al., 2020). Also, most previous research has as yet refrained mainly from replication of experimental designs across different environments, also systematically adjusting their treatments, primarily focusing on whether a specific measure is successful in reducing NSB rather than addressing the question of which approach can reduce whose behavior in which context. Similarly, most previous studies have refrained from a more nuanced discussion of the potential adverse spillover effects from introducing such measures (e.g., a reduction in mutual trust, potentially arising from the feeling of being deceived or manipulated), primarily exploring short term effects.

Accordingly, based on our reading, there is no definitive answer to the question of an ideal countermeasure. In contrast, the effectiveness of such measures might, ultimately, be highly context-sensible, and we, therefore, believe that future research is undoubtedly well-advised to explore these contexts in more nuance.

5.5.1 | Reminders

Most of the studies on the management of NSB in our sample address the effectiveness of different reminder systems on patient NSB (cf. Table A2 in the Appendix). In Table 3, we provide an overview of the effectiveness of such reminders, depending on the distribution channel, as well as the distribution frequency and timing, its reception, and the recipient's patient status. As can be seen easily from this table, the use of reminders tends to be an efficient measure to reduce NSB. However, the evidence is not unambiguous and might, to some degree, also depend on specific reminder characteristics.

In sum, previous research suggests a largely similar effect from employing telephone and text message reminders. As such those authors comparing different reminder types tend to recommend the use of text messaging, primarily because the distribution of such short messages ties up fewer resources (e.g., Liew et al., 2009).

Telephone reminders

As we show in Table 3, the potential effectiveness of employing a telephone reminder to reduce patient NSB might ultimately depend on effective reminder delivery. That is, although only two out of three author teams were able to document a significant reduction in NSB after having called a patient, almost all of those studies successfully shaping subsequent decision-making featured a

TABLE 3 Effectiveness of reminders in reducing patient no-show behavior

	Frequency			Timing			Delivery ^b					Patient group				
			Total	Region	1	2	≤2 days prior	3-7 days prior	>7 days prior	Un-specified	Direct	Message left	Auto-mated	Not delivered	Patient group	
															All	New
Telephone reminder (Insig.)	8	EU, SA	6	2	6	-	1	1	1	3	1	2	2	6	-	2
Telephone reminder (Sign. ^a)	16	AS, EU, NA, OC, SA	14	2	9	5	1	1	1	14	4	2	-	12	1	3
Text-message reminder (Insig.)	6	AS, EU, OC	6	-	6	-	-	-	-	6	-	-	-	4	-	2
Text-message reminder (Sign. ^a)	15	AS, EU, NA, OC, SA	14	1	12	2	1	1	-	15	-	-	-	11	2	2
Mail/ Letter reminder (Insig.)	2	EU, NA	2	-	1	1	-	-	-	2	-	-	-	2	-	-
Letter reminder (Sign. ^a)	2	EU	2	-	-	1	-	-	1	2	-	-	-	1	-	1
Mix of different reminders (Sign. ^a)		EU	1	-	1	-	-	-	-	1	-	-	-	1	-	-

Abbreviations and notes: ^aSignificant at least at the 0.05 level; Asia (AS); ^bNumbers may not add up to total number as more than one result per study was considered.; Europe (EU); North America (NA); Note: Insignificant (Insig.); Oceania (OC); Significant (Sign.); South America (SA).

direct delivery approach (e.g., Lagman et al., 2021). Although this does not mean that telephone reminders delivered via voice mail (e.g., Haynes & Sweeney, 2006) or an automated phone call (e.g., Henry et al., 2012) are entirely unsuitable, empirical evidence on these approaches is rather ambiguous. Similarly, and perhaps surprisingly, further reminder characteristics, most notably the timing of delivery, seem less significant in shaping the reminder effectiveness.

Also, it seems rather obvious that if a patient is not reached, and no message can be left, the potential effect of a telephone reminder cannot unfold (e.g., Percac-Lima et al., 2015). For instance, this might be particularly problematic if such a standardized reminder system is intended to target homeless patients, minorities, or the mentally disordered, all of which have been found to be largely irresponsive to such a treatment (Henry et al., 2012), though for different reasons.

Text-message reminders

As with telephone reminders, text message reminders via short message service (SMS) are likely to reduce patient NSB. That is, about two out of three author teams were able to document a significant reduction once an SMS was sent to patients. In particular, this seems true for new patients, though, perhaps because patient NSB tends to be, per se, less prominent among those patients with a follow-up appointment (e.g., Milne et al., 2006).

Intriguingly, we, once more, note no clear picture on reminders characteristics, including both reminder frequency and timing. One potential explanation for the ambiguous evidence could be that patient behavior differs between subspecialties, perhaps also reflecting variations in the patients' socio-demographic profile. That is, while one author team found a significant effect of text-message reminders in reducing patient NSB in both a General Medicine and a Neurology, the effect of the same reminder in an Obstetrics and Gynecology clinic, in contrast, was insignificant (Youssef et al., 2014).¹⁵ An alternative explanation, however, points to the role of the stimulus itself. More precisely, assessing the effectiveness of different narratives in the text-message reminder, the authors of one particular study observe that inducing emotional guilt, that is, by using a narrative describing the negative consequences of no-shows, is potentially most successful in reducing no-shows when compared to a control group with a simple reminder (Berliner Senderey et al., 2020). Similarly, narratives addressing appointment costs, emotional relatives, social norms, and the patient's social identity significantly reduced NSB (Berliner Senderey et al., 2020).

Postal reminders

While most previous research in our data set has explored either telephone (23 studies) and/or text message reminder (21), apparently, the interest in analyzing postal reminders is significantly lower. That is, according to our data set, we only observe four studies on such reminder effectiveness, and, not very encouraging, those authors also report mixed evidence.

5.5.2 | Customer-centricity initiatives

In the healthcare industry, introducing customer-centricity initiatives seems like a promising approach to reduce patient NSB. For instance, several authors (e.g., DuMontier et al., 2013) have observed that introducing a customer-friendly scheduling (e.g., increased booking flexibility, online booking, reduced waiting times, etc.) is likely to reduce patient NSB. Similarly, some authors (e.g., Norbash et al., 2016) found a well-trained, customer-centric clinic staff, as well as a welcoming clinic environment, to positively affect patient decision-making. Intriguingly, addressing potential difficulties arising from long patient journeys, offering appointments in domiciliary

clinics, in other words, doctoral home visits, significantly reduced patient NSB (Anderson & Aquilina, 2002). Simplifying patient journeys through the public transportation expansion has shown significant success in reducing NSRs especially among those patients that lived close to the new rail line and those that were covered by Medicaid health insurance. Interestingly, Greenup et al. (2019) found no effect of the introduction of telehealth appointments on NSRs for Australian specialist out-patient appointments. However, during the COVID-19 pandemic, Franciosi et al. (2021) found significantly lower NSRs for telehealth appointments in non-surgical specialties.

5.5.3 | Counseling through interventions

In both the education and the healthcare industry, introducing interventions have shown some first promise in reducing NSB, but the evidence is not conclusive. For instance, in the healthcare industry, counseling has proven to be an overwhelmingly successful measure to reduce patient NSB in different subspecialties, that is, diabetic clinic, pediatric clinic, substance use disorder clinic and colonoscopy (e.g., Weaver et al., 2019). Somewhat similarly, in the education industry, counseling parents through information letters of elementary school children with extreme truancy patterns, as well as visits by a school attendance officer, significantly reduced the NSB of children (McCluskey et al., 2004). Intriguingly, additional interventions, here a referral to the social service and, then, the police, however, were not successful, indicating that some no-shows might ultimately remain uninfluenceable. Somewhat similar, a school's social work services, organizing interventions with students, school personnel, parents, and an outside agency representatives, was found to be ineffective in addressing truancy among students in grade six to nine (Newsome et al., 2008).

5.5.4 | Negative and positive incentive mechanisms

Based on the limited experimental evidence generated in both the education and healthcare industry, introducing a negative incentive mechanism, that is, a mechanism punishing the no-show (e.g., by refusing the right to access a service in the future), to reduce NSB through such nudges seems rather unpromising. For instance, while Snyder et al. (2014) observe an adverse effect of a compulsory attendance policy, that is, a punishment following more than three no-show appearances by a grade penalty, on student NSB in a quasi-experimental design, referring heavy truants to the community police was unsuccessful in reducing NSB (McCluskey et al., 2004). Somewhat similarly, in the healthcare industry, Chariatte et al. (2007) found no significant effect of introducing a punishment, a no-show fine, on NSB in Europe. However, an alternative explanation for the lack of effectiveness might be that the perceived cost of NSB might have just not been high enough to alter their behavior in the short term. As such, future experimental NSB research might benefit significantly from (1) comparing the effect of varying degrees of penalties and (2) adding controls either capturing or proxying an individual's reference point to induce loss aversion (e.g., based on socio-economic profiles).

Intriguingly, only one study in our dataset has explored the potential of introducing positive incentives, that is, a reward, to participants at a research center. Here, offering a small gift (e.g., soap, clothes, bus pass) led to a significant reduction in NSB (Pollastri et al., 2005); that is, from 31.9% to 16.4%. Still, as some service providers operate on relatively small profit margins (e.g.,

restaurant owners), it remains unclear whether such a measure is economically viable, even given potential robustness across industries.

6 | LIMITATIONS AND POTENTIAL RESEARCH AVENUES

Although we have documented that NSB research has been previously conducted across different industries, not all of these industries have generated a similar interest. For instance, in the field of sports economics, spectator NSB has only recently attracted some first attraction. However, according to our data sample, the discipline's scope has been limited, primarily exploring the German (e.g., Frevel & Schreyer, 2019) and, more recently, the Swiss football market (Schreyer & Torgler, 2021). Similarly, only a few authors have explored passenger NSB, primarily analyzing the US market at the beginning millennium (e.g., Garrow & Koppelman, 2004a). As such, our understanding of the robustness of the documented effects, most of them relating to product characteristics and the opportunity costs arising from physical attendance, is limited, and in some aspects, perhaps, even potentially outdated. On a more general note, it seems rather surprising that the need to understand the antecedents of NSB in service industries as diverse as the beauty (e.g., beauty studios, hairdresser), entertainment (e.g., concerts, opera, and theater), and the hospitality industry (e.g., restaurants), has not yet attracted more research interest among economists at all. Therefore, we believe that the field would benefit from additional research exploring both the determinants shaping and the potential measures reducing NSB not only across additional industries but certainly also more diverse markets within these industries.

Intriguingly, however, even in the one industry that has attracted notable attraction, that is, the health industry, our understanding of those factors shaping patient NSB is slowly emerging at best. In fact, in this environment, a rather wild growth of explanatory variables, inconsistently approximated across many studies, and a highly fragmented market of subspecialties has led to ambiguous findings for all but a few explanatories, thus preventing the field from identifying clear patterns among those factors that might ultimately shape patient decision-making. Thus, although we would not expect that determinants are perfectly comparable across sectors such as education, healthcare, and professional football, a more inclusive set of standardized explanatories (e.g., the use of metric scales for product characteristics such as the price for the service and scheduled appointment time, or socioeconomic factors such as the age, as well as a systematic test for nonlinearity) would most certainly allow for a better generalizability of factors.

Finally, there seems as yet no final verdict on an ideal measure to reduce NSB. In fact, while most previous research has centered around understanding the role of potential determinants in shaping NSB better, only a few authors have begun analyzing the potential of countermeasures, including potential negative spillover effects. As such, although we have documented a promising effect of using reminders in reducing NSB, our understanding of those mechanisms making such reminders effective is less pronounced. As such, we believe that adding nuance to this existing understanding offers, as well as further exploring alternative measures, makes for an exciting research path in experimental economics, among others.¹⁶

In this context, lastly, adding to our understanding of the dynamics of NSB, as well as the context in which such behavior occurs, makes for another fascinating path in NSB research that might be well worth exploring. In fact, while measures such as the introduction of negative incentives might be successful in the short term, for instance, if demand for a given service exceeds its supply regularly, the same measure might harm the service provider's business in the long term – for example, due to a perceived decrease in the level of mutual trust. In some industries, most notably the

education industry, where learning success is, to some degree, also dependent on the interaction among service recipients, such a decrease in mutual trust might then result in non-cooperation (e.g., among group members), potentially affecting the learning outcomes of not only the no-show but also largely uninvolved third parties. Regardless of the industry, it is mainly unclear whether and to what extent such NSB affects these third parties' decisions to omit attendance – an effect that would then amount to a vicious circle.

Naturally, our interdisciplinary literature review is not without its limitations. For instance, although we attempted to provide a more holistic perspective on NSB research than most previous studies, this interdisciplinary perspective heavily draws from quantitative studies, ignoring conventional, qualitative studies and survey-based research literally by design. Although qualitative studies, in particular, might be considered a natural prerequisite for further quantitative analysis by some, this naturally bears the risk of omitting perspectives, and future research might, therefore, be well-advised to add this complimentary perspective. Further, as we were primarily interested in synthesizing the status-quo of NSB research, we largely refrain from a quality assessment of those almost 100 studies in our literature sample, that is, beyond excluding potentially predatory journals. Accordingly, our scoping of the extant literature is relatively brief and, thus, certainly leaves room for more detailed bibliometric and scoping reviews, as well as scientometric analysis in the future,¹⁷ perhaps even exploiting a significantly longer period of observation. Somewhat similarly, although we point to methodological differences as a potential source of contradicting findings occasionally (e.g., the approximation for age), we have certainly refrained from an in-depth analysis of the effects of such methodological (design) choices; a limitation that, as we hope, might inspire more focused research on specific antecedents in the future (e.g., during meta-analyses). Finally, we must admit that our focus is relatively narrow, excluding empirical studies exploring admissions/utilization and late cancellations, the latter of which can bear almost similar consequences depending on the timing. Therefore, while our keywords seem sufficient in generating a rich sample, future surveys might seek to integrate such studies, reflecting on potential differences in the underlying mechanism to paint a more comprehensive paper. The similar holds for the possible inclusion of literature that has been written in different languages than English.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTES

¹Interestingly, on a more general note, such NSRs seem significantly higher among season ticket holders (e.g., Schreyer & Torgler, 2021). For instance, in a more recent working paper, Amberger et al. (2021) analyze admission/

NSB at Czech football club AC Sparta Praha during the more recent season 2018-19, documenting a NSR of about 31% among season ticket holders.

² It is, perhaps, important to mention that, while searching EBSCO, the explicit use of hyphens did not influence search results and were therefore neglected.

³ In other words, we also exclude discussion/working papers (e.g., Amberger et al., 2021) and, perhaps more importantly, book chapters that tend to refrain from presenting additional empirical insight, despite offering additional synthesis (e.g., Schreyer, 2021a; 2021b).

⁴ As one reviewer has rightfully noted, Carreras-García et al. (2020) also reviewed the extant literature on NSB in the healthcare industry. Unfortunately, these authors fail to provide an explicit definition of NSB, thus also including studies on late cancellations in their sample, among others.

⁵ However, in Section 5 of our manuscript, we will build upon this previous work, complementing it with empirical work published in the aftermath of their publication.

⁶ Here, the definition of NSB had to be explicit. In case of doubt, we excluded the article.

⁷ Beall's list, created by librarian Jeffrey Beall and distributed through his blog, was a well-known list of potential predatory journals and publishers, intending to list open-access publishers publishing any article effectively without peer review (as long as the author or authors pay an open access fee). The list was removed from Beall's blog in early 2017 but is still available online and occasionally updated (e.g., beallslist.net).

⁸ For analytical reasons, we count articles that explore both antecedents and countermeasures as two separate articles. However, with only one such article in our sample (Bellucci et al., 2017), such overlaps are surprisingly rare.

⁹ In the Appendix, we list all those studies by area, primarily to increase the transparency of our systematic review process (c.f., Table A1 and A2).

¹⁰ As is evident from our brief literature scoping results, we exploit SJR because natural alternatives, most notably JEL or the Chartered Association of Business Schools Academic Journal Guide (AJG) 2021, only list a fraction of the journals in our data set.

¹¹ In some cases, a journal falls into multiple subject areas. For instance, the Australasian Journal of Information Systems is classified as a journal in three different but certainly related subject areas: (1) Business, Management, and Accounting; (2) Computer Science; and also (3) Decision Sciences.

¹² Interestingly, these 34 contributions to the literature were generated across various markets, i.e., Argentina (1 contribution; Briatore et al., 2020), Australia (2; e.g., Bellucci et al., 2017), Belgium (1; Goossens et al., 2021), China (1; Hu et al., 2020), Denmark (2; e.g., Wolff et al., 2019), Ireland (1; Hannan et al., 2021), Israel (1; Ratmansky et al., 2017), Mexico (1; Negrete-Najar et al., 2021), New Zealand (1; Lamba et al., 2019), Singapore (2; e.g., Chua & Chow, 2019), South Korea (2; e.g., Suk et al., 2021), Taiwan (1; Tsai et al., 2019), and the United States (18; e.g., Rosenbaum et al., 2018) and should, therefore, add to our understanding of the robustness of the observed effects. Here, perhaps a bit surprising, we neither observe continent nor country-specific differences in the reported NSRs.

¹³ Unlike in North American professional sporting leagues, for instance, most European sporting leagues operate on an open promotion and relegation system.

¹⁴ When paper tickets were still in use, passengers were often able to switch flights or even airlines on short notice, thereby generating a no-show for their original booked flight. Also, losing a paper ticket was often associated with paying a fine for a replacement, or even buying an entirely new ticket, which may lead passengers to refrain from taking the flight. Similarly, speculative bookings; i.e., bookings that have been neither confirmed nor paid for, often remain unused.

¹⁵ Intriguingly, findings from a study employing different reminders allow for a similar conclusion (Perron et al., 2010).

¹⁶ For instance, in a recent working paper, Schreyer and his co-authors (2020) show that reminders might not be an efficient means to reduce NSB in the sporting context, perhaps because forgetfulness is less evident here.

¹⁷ We want to thank a reviewer for pointing us in this direction. Although certainly interesting, we have decided to omit such an analysis because an initial correlation analysis between a manuscript's publication year and both the journal ranking quartiles within a subdiscipline using the SJR citation index as well as the so-called SJR value, i.e., a common measurement of journal quality, revealed no significant correlation. This might, however, be different, exploiting a more extended period and more nuanced analyses.

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APPENDIX A

TABLE A1 Empirical studies on the determinants of no-show behavior by area

#	No-shows	Authors	Year	Market	Journal	Field ¹
1	Passengers	Garrow/Koppelman	2004a	USA	J of Revenue and Pricing Management	Interdisciplinary ²
2	Passengers	Garrow/Koppelman	2004b	USA	J of Air Transport Management	Interdisciplinary ²
3	Patients	Blæhr et al.	2016	DEN	Danish Medical J	Medicine
4	Patients	Krishnamurthy et al.	2016	USA	Pain Physician	Medicine
5	Patients	Bellucci et al.	2017	AUS	Australasian J of Information Systems	Interdisciplinary ²
6	Patients	Harvey et al.	2017	USA	J of the American College of Radiology	Medicine
7	Patients	Ratmansky et al.	2017	Israel	Israel J of Health Policy Research	Medicine
8	Patients	Shrestha et al.	2017	USA	J of Clinical Gastroenterology	Medicine
9	Patients	Lynn et al.	2018	USA	Cleft Palate-Craniofacial J	Interdisciplinary ²
10	Patients	Mander et al.	2018	AUS	J of Medical Radiation Sciences	Interdisciplinary ²
11	Patients	Rosenbaum et al.	2018	USA	J of the American College of Radiology	Medicine
12	Patients	Lee et al.	2018	USA	J of Healthcare Management	Interdisciplinary ²
13	Patients	Chua/Chow	2019	SGP	Proceedings of Singapore Healthcare	Medicine
14	Patients	Briatore et al.	2020	ARG	Int J of Health Planning and Management	Medicine
15	Patients	Hunter et al.	2019	USA	American J of Rhinology and Allergy	Medicine
16	Patients	Lamba et al.	2019	NZ	New Zealand Medical Journal	Medicine
17	Patients	Liu et al.	2019	SGP	Manufacturing and Service Operations Management	Interdisciplinary ²

(Continues)

TABLE A1 (Continued)

#	No-shows	Authors	Year	Market	Journal	Field ¹
18	Patients	Mieloszyk et al.	2019	USA	J of the American College of Radiology	Medicine
19	Patients	Starnes et al.	2019	USA	Family Medicine	Medicine
20	Patients	Tsai et al.	2019	Taiwan	J of the Chinese Medical Association	Medicine
21	Patients	Wolff et al.	2019	DEN	BMC Health Services Research	Medicine
22	Patients	Bell et al.	2020	USA	Journal of Parkinson's disease	Interdisciplinary ²
23	Patients	Curry et al.	2020	USA	J of the American Academy of Orthopaedic Surgeons	Medicine
24	Patients	Hu et al.	2020	China	J of Cleaner Production	Interdisciplinary ²
25	Patients	Kemp et al.	2020	USA	J of the American College of Surgeons	Medicine
26	Patients	Kim et al.	2020	KOR	J of Korean medical science	Medicine
27	Patients	Agarwal et al.	2021	USA	Laryngoscope	Medicine
28	Patients	Ahmad et al.	2021	USA	Int J of Healthcare Management	Interdisciplinary ²
29	Patients	Boshers et al.	2021	USA	Health and Social Care in the Community	Interdisciplinary ²
30	Patients	Brown et al.	2021	USA	J of the American Academy of Dermatology	Medicine
31	Patients	Chiam et al.	2021	USA	American Journal of Ophthalmology	Medicine
32	Patients	Flores et al.	2021	USA	Pediatric radiology	Medicine
33	Patients	Goossens et al.	2021	BEL	European J of Cardiovascular Nursing	Interdisciplinary ²
34	Patients	Hannan et al.	2021	IRL	Irish Medical Journal	Medicine
35	Patients	Negrete-Najar et al.	2021	MEX	Gerontology	Interdisciplinary ²

(Continues)

TABLE A1 (Continued)

#	No-shows	Authors	Year	Market	Journal	Field ¹
36	Patients	Suk et al.	2021	KOR	Int J of Environmental Research and Public Health	Interdisciplinary ²
37	Spectators	Schreyer/Däuper	2018	GER	Applied Economics Letters	Economics ³
38	Spectators	Frevel/Schreyer	2019	GER	Applied Economics Letters	Economics ³
39	Spectators	Schreyer	2019	GER	Applied Economics	Economics ³
40	Spectators	Schreyer et al.	2019	GER	Journal of Sports Economics	Interdisciplinary ²
41	Spectators	Schreyer/Torgler	2021	GER	Applied Economics	Economics ³

Abbreviations and notes: We list all 41 empirical studies in topical, then chronological and alphabetical order (based on the first author's surname). Argentina (ARG); Australia (AUS); Belgium (BEL); Denmark (DEN); Germany (GER); International (Int); Ireland (IRL); Journal (J); Mexico (MEX); New Zealand (NZ); Singapore (SGP); South Korea (KOR); United States of America (USA). ¹According to the Scimago Journal & Country Rank (SJR); ²Journal falls into multiple subject areas; ³Subject area is labeled Economics, Econometrics, and Finance.

TABLE A2 Empirical studies on no-show behavior countermeasures by area

#	No-shows	Authors	Year	Market	Journal	Field ¹
1	Patients	Tibble et al.	2000	UK	Endoscopy	Medicine
2	Patients	Hardy et al.	2001	UK	BMJ: British Medical J	Medicine
3	Patients	Maxwell et al.	2001	USA	J of Health Care for the Poor and Underserved	Medicine
4	Patients	Anderson/Aquilina	2002	UK	Int J of Geriatric Psychiatry	Medicine
5	Patients	Lee/McCormick	2003	IRL	J of the Royal Society of Medicine	Medicine
6	Patients	Reti	2003	NZ	New Zealand Medical J	Medicine
7	Patients	Adams et al.	2004	AUS	Endoscopy	Medicine
8	Patients	Bos et al.	2005	NED	American J of Orthodontics and Dentofacial Orthopedics	Dentistry
9	Patients	Scott/Lyon	2005	SCO	Int J of Consumer Studies	Interdisciplinary ²
10	Patients	Haynes/Sweeney	2006	USA	Respiratory Care	Medicine
11	Patients	Milne et al.	2006	UK	Health Care Management Review	Interdisciplinary ²
12	Patients	O'Connor et al.	2006	USA	Archives of Pediatrics and Adolescent Medicine	n/a
13	Patients	Chariatte et al.	2007	SUI	Swiss Medical Weekly	Medicine
14	Patients	Oladipo et al.	2007	UK	J of Lower Genital Tract Disease	Medicine
15	Patients	Fairhurst/Sheikh	2008	UK	BMJ Quality and Safety	Medicine
16	Patients	Geraghty et al.	2008	IRL	Journal of Laryngology and Otology	Medicine

(Continues)

TABLE A2 (Continued)

#	No-shows	Authors	Year	Market	Journal	Field ¹
17	Patients	Jayaram et al.	2008	UK	BMC Psychiatry	Medicine
18	Patients	Koshy et al.	2008	UK	BMC Ophthalmology	Medicine
19	Patients	Liew et al.	2009	MYS	British Journal of General Practice	Medicine
20	Patients	Milne	2010	SCO	Int J of Consumer Studies	Interdisciplinary ²
21	Patients	Parikh et al.	2010	USA	American J of Medicine	Medicine
22	Patients	Perron et al.	2010	SUI	BMC Family Practice	Medicine
23	Patients	Altuwaijri et al.	2012	SAU	Saudi Medical Journal	Medicine
24	Patients	Henry et al.	2012	USA	J of the Association of Nurses in AIDS Care	Nursing
25	Patients	Taylor et al.	2012	AUS	Archives of Physical Medicine and Rehabilitation	Interdisciplinary ²
26	Patients	DuMontier et al.	2013	USA	Family Medicine	Medicine
27	Patients	Molfenter	2013	USA	Substance Use and Misuse	Interdisciplinary ²
28	Patients	Narring et al.	2013	SUI	J of Epidemiology and Community Health	Medicine
29	Patients	Perron et al.	2013	SUI	BMC Health Services Research	Medicine
30	Patients	Youssef et al.	2014	SAU	J of Taibah University Medical Sciences	Medicine
31	Patients	Mani et al.	2015	USA	Children	n/a
32	Patients	Percac-Lima et al.	2015	USA	Cancer	Interdisciplinary ²
33	Patients	Norbash et al.	2016	USA	J of Magnetic Resonance Imaging	Medicine
34	Patients	Shah et al.	2016	USA	J of General Internal Medicine	Medicine
35	Patients	Bellucci et al.	2017	AUS	Australasian J of Information Systems	Interdisciplinary ²
36	Patients	Compère et al.	2017	FRA	European J of Anaesthesiology	Medicine
37	Patients	Jenkins	2017	UK	Community Mental Health J	Interdisciplinary ²
38	Patients	Liu et al.	2017	USA	J of the American College of Radiology	Medicine
39	Patients	Teo et al.	2017	USA	Psychiatric Services	Medicine
40	Patients	Chong/Fantl	2017	USA	Urologic Nursing	Medicine
41	Patients	Blæhr et al.	2018	DEN	BMJ Open	Medicine
42	Patients	Dusheiko/Gravelle	2018	UK	Health Economics	Medicine
43	Patients	Drabkin et al.	2019	USA	Clinical Imaging	Medicine
44	Patients	Greenup et al.	2019	AUS	Australian Health Review	Medicine
45	Patients	Weaver et al.	2019	USA	J of Community Health Nursing	Interdisciplinary ²
46	Patients	Wolthers	2019	DEN	Danish Medical J	Medicine
47	Patients	Bueno et al.	2020	BRA	Revista Paulista de Pediatria	Medicine
48	Patients	Graham et al.	2020	CAN	J of Medical Internet Research	Medicine
49	Patients	Lam et al.	2021	HKG	J of Gastroenterology and Hepatology	Medicine

(Continues)

TABLE A2 (Continued)

#	No-shows	Authors	Year	Market	Journal	Field ¹
50	Patients	Berliner Senderey et al.	2020	ISR	PLoS ONE	Multidisciplinary
51	Patients	Franciosi et al.	2021	USA	Telemedicine J and e-health	Interdisciplinary ²
52	Patients	Lagman et al.	2021	USA	American J of Hospice and Palliative Medicine	Medicine
53	Patients	Smith et al.	2021	USA	Health Services Research	Medicine
54	Students	McCluskey et al.	2004	USA	Crime and Delinquency	Interdisciplinary ²
55	Students	Newsome et al.	2008	USA	School Social Work Journal	n/a
56	Students	Snyder et al.	2014	USA	J of Education for Business	Interdisciplinary ²
57	Research participants	Pollastri et al.	2005	USA	Experimental and Clinical Psychopharmacology	Interdisciplinary ²

Abbreviations and notes: We list all 57 empirical studies in chronological, then alphabetical order (based on the first author's surname). Australia (AUS); Brazil (BRA); Canada (CAN); Denmark (DEN); France (FRA); Hong Kong (HKG); International (Int); Ireland (IRL); Israel (ISR); Journal (J); Malaysia (MYS); Netherlands (NED); Switzerland (SUI); United Kingdom (UK); United States of America (USA). ¹According to the Scimago Journal & Country Rank (SJR); ²Journal falls into multiple subject areas.