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Research article

Assessing the scale of adoption of sustainability practices by community pharmacies in Spain in the time of COVID-19

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A B S T R A C T

Community pharmacies play a critical societal role and are well placed to enable the progress of national health systems towards sustainability. Nevertheless, there is a dearth of research which has been set up to understand sustainability practices adopted by community pharmacies and evaluate the drivers behind their adoption. This study undertook an exploratory analysis of 95 community pharmacies in Spain, measured their engagement with sustainability practices and assessed these practices in light of the COVID-19 pandemic. The results demonstrated the room for improvement in the adoption of green procurement practices in pharmacies and in their engagement with the community. Moreover, the study showcased that, during the COVID-19 crisis, the pharmacies with the largest extent of adoption of sustainability practices implemented preventative measures against the pandemic in a more diverse number during the first weeks of the lockdown, compared to their less sustainable counterparts. This indicates that, to build resilience to future (health) crises, the implementation of sustainable practices in community pharmacies should be encouraged by both policy makers and pharmaceutical firms.

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1. Introduction

Sustainability of healthcare provision represents a fairly recent, but rapidly developing, study area (Capolongo et al., 2015). Environmental risks of pharmaceutical and medicinal products (Hushek et al., 2004), unfair distribution of big pharma profits (Weber, 2006), unequal and/or restricted access of patients to medical treatment (Flores and Tomany-Korman, 2008), and the negative impact of the laborious medical work on employee health and well-being (Hall et al., 2016) offer a strong rationale for the need to advance the healthcare sector towards sustainability. The COVID-19 pandemic has provided further reinforcement to this need. This is because the huge burden of work assumed by the healthcare community (Baker et al., 2020), extraordinary risk exposure (Ng et al., 2020) and disproportionate quantities of waste being produced by healthcare organisations (Wang et al., 2020) as a result of the pandemic outbreak can be observed in the presence of increased profitability of the pharma industry (Jolly, 2020) and consequently acceleration of the ‘rich/poor’ divide in their accessibility to medical services (Takian et al., 2020).

Despite the importance of enhancing the sustainability of the healthcare sector, the related research agenda remains limited in scope and scale of analysis. Past research has failed to adequately consider the challenges of transition towards sustainability goals in many of the integral elements of the national healthcare systems (Capolongo et al., 2015), as, up to now, the focus has been on hospitals (see, for instance, (McGain and Naylor, 2014) (Sawaleem et al., 2009) (Tsakoma et al., 2007), (Filimonau and De Coteau, 2009)). Community pharmacies in particular also represent important agents of sustainability in a healthcare system (García-Cardenas et al., 2020). This is because they are conveniently positioned as the ‘centres of gravity’ linking the supply - big pharma companies, to demand - the general public (Khosravi and Izbirak, 2019). The work of community pharmacies is closely observed and regulated by local authorities that are usually tasked to promote the sustainability agenda across the national healthcare systems (Boyle et al., 2014). This suggests that community pharmacies play a critical societal role in that they are well placed to communicate, and advance the need to become more sustainable, to both their suppliers and customers. Indeed, there are diverse ways through which Community Pharmacies can enhance...
sustainability: as easy access front line health care professionals, they can, for instance, facilitate proper drug disposal (Kumar et al., 2019), prioritise the offering of most sustainable products (Xie & Breen, 2012) and advise consumers in the proper use of medicines (Hepler, 2004), among many other initiatives.

Past research on the sustainability of community pharmacies is limited in a number of aspects. First, the number of studies published on this topic in peer-reviewed English literature remains scarce. For example, a recent systematic literature review undertaken by (Crespo-Gonzalez et al., 2020) (2020) on the challenges of sustainability innovations in healthcare has identified only three studies with an explicit focus on (different types of) pharmacies. This is surprising, given the importance of community pharmacies as agents of sustainability across the supply chains of healthcare provision (Garcia-Cardenas et al., 2020). Second, similar to the healthcare sector as a whole, extant studies on pharmacies have primarily been concerned with the environmental aspects of their operations, such as hazards/PHARMACEUTICAL waste generation (see, for example, Kümmerer & Hempel, 2010). The social and economic pillars of sustainability have been considered to a much lesser degree and, as stated by Nazar et al. (2019) there is a lack of empirical studies on the social aspects of pharmacy work. Lastly, the geographical scope of extant research is limited to pharmacies in English or German speaking countries (Kümmerer & Hempel, 2010). Despite the popularity and important community role of pharmacies in the Spanish speaking world, no studies exist in peer-reviewed English literature in this important market of healthcare provision.

Furthermore, in the context of the COVID-19 pandemic, the roles and responsibilities of Community Pharmacies need to be re-examined (Hedima, Adeyemi, & Ikunaiye, 2020), in light of the vital and renewed role to play in response to the pandemic (Cadogan & Hughes, 2020). To the best of our knowledge, no previous study has aimed at understanding the characteristics that explain the initiatives undertaken by pharmacists to help in relieving the consequences of the health crisis.

In addressing the above-mentioned gap in the literature, this paper contributes to knowledge with an exploratory study of community pharmacies in Spain. The study has set to understand (1) what sustainability practices pharmacies have adopted in house; and (2) the rationale behind their adoption alongside perceived barriers for the implementation of sustainability-oriented initiatives. Furthermore, given the COVID-19 pandemic has negatively impacted the performance of all economic sectors of the global and national economies, the study has aimed to (3) evaluate the preventative and protective measures adopted by community pharmacies following the virus outbreak; and (4) establish if the extent of these measures adopted relates to the sustainability commitments of pharmacies and depends on their characteristics. This paper focuses on Spain with its well-established market of healthcare provision which has implemented a range of initiatives in pursuit of the goal of sustainability. These initiatives will be briefly reviewed in the next section.

2. Literature Review

2.1. The societal role of community pharmacies

Community pharmacies (also known as chemists in some countries), which include both retail pharmacies (operating in high street locations, urban and rural neighbourhoods and supermarkets) and outpatient pharmacies (operating in hospitals), are a pivotal part of a national healthcare system. In most countries, on top of dispensing prescription medicines, community pharmacies provide pharma services and sell other health related products such as over-the-counter drugs, supplements and health-related devices (Zheng et al., 2021). Apart from guaranteeing access to medicines, community pharmacies play a relevant role in public health, informing and advising patients and helping in early detection and referral of individuals potentially in risk (FIP Health Advisory, 2020). As stated by Hepler (2004, p. 1497), pharmacists contribute to “safer and more effective drug therapy, patient welfare, and the good of society”. Being frontline staff and often the first port of call for patients in the community, with most of the population being able to access a pharmacy near their homes, pharmacists provide a significant benefit to society as they are the only healthcare professionals available for consultation without an appointment (Peña and Roohil Yusuf, 2011). This is particularly true during the COVID19 crisis (COBF, 2021).

Moreover, advise-giving by pharmacists about medicine usage and symptom management has long been recognised as a means to reduce the workload of family physicians, thus minimising the impact of public demand on national healthcare systems and enabling priority access to medical services for those in greater need (Rogers, Hassell, Noyce, & Harris, 1998). Furthermore, studies have also shown that community pharmacies could significantly accelerate vaccination coverage (Schwerzmann et al., 2017).

2.2. Community pharmacies in Spain

Community pharmacy services in Spain are regulated by National Law no. 16/1977 and include not only the exclusive distribution of medicines, but also the provision of patient counselling services, medication review with follow-up and pharmacovigilance (Gastelurrutia, Faus, & Martínez-Martínez, 2020). It is interesting to note that pharmacists perform social and care work with a relevant impact in Spain, as it is estimated that two million citizens visit retail pharmacies every day (Peña and Roohil, 2011). Actually, Spain has one of the highest concentrations of pharmacies in the EU, with 2,117 inhabitants per pharmacy and an average turnover of €911,740 in 2019 (Gastelurrutia et al., 2020). There are around 22,000 community pharmacies in Spain, all of them privately owned and independent, falling, thus, into the category of small and medium sized enterprises (SMEs). Pharmacy chain stores are not allowed in Spain: only pharmacists can own a pharmacy and it is illegal to own more than one (Gastelurrutia, Faus, & Fernández-Llimós, 2005).

Medications are exclusively sold in community pharmacies in Spain, and prices are fixed by the government. There are different levels of copayment for drugs, the average percentage in 2002 being 6.3%, the second lowest in the European Union (Gastelurrutia et al., 2005). Community pharmacies are reimbursed by the National Health System at a fixed margin on the pharmacy retail price (Gastelurrutia et al., 2020).

2.3. Sustainability in community pharmacies

Following the development in the roles of community pharmacies, together with the ever growing funding constraints, attention has moved towards more sustainable community pharmacies and the need for building more integrated and efficient health supply chains (Breen et al., 2017). Despite scholars agreeing that community pharmacies can improve the sustainability of the industry in diverse ways, Breen et al. (2017), in a study among 44 community pharmacists in the UK, found that sustainability practices were not prioritised, allegedly due to time restraints. That being said, they did identify strong personal sustainability consciousness among pharmacists. The aim of sustainable practices undertaken by pharmacists in this study was found to be “to save money, reduce waste and be more efficient”.

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2.3.1. Environmental sustainability in community pharmacies

Despite the individual impact of SMEs on the environment possibly being limited, their collective role is significant (Schaper, 2002). Schaper goes further and lists some of the most relevant ways in which this type of firm can impact the environment, including engagement in recycling activities, involvement in environmental lobby groups, the packaging they provide to consumers, equipment purchases and usage, purchases of environmentally friendly products and staff training, among others. Community pharmacies, in particular, can help reduce the negative impact of the pharmaceutical industry on the environment by helping improve patient disposal of expired or unused medications, improving the release of drugs, reducing household sewage mixed with surplus drugs, as well as by ensuring the procurement of products with minimal negative impact on the environment and society (Kumar et al., 2019). Indeed, disposal of pharmaceutical waste (expired or unused medication) can be costly and damaging for the environment, and harmful drug components have been found in surface and groundwater, sewage and even drinking water (Xie & Breen, 2012). In line with this important societal role of pharmacies, Daughton and Ruhoy (2008) introduced the concept of PharmEco-vigilance, adding environmental concern to the analysis of potential adverse impacts of drugs. They state that proper disposal of drugs is important not only for avoiding risk of human morbidity and mortality due to purposeful abuse or accidental poisonings resulting from accumulated stockpiles awaiting disposal, but also for avoiding unnecessary leakage of drugs into the environment. Without a doubt, pharmaceutical waste can be considered a relevant contaminant that can reach the environment in different ways, provoking harmful effects not only on the environment but also to human health, i.e. contributing to the increase of antibiotic resistance (Bungai et al., 2018).

In this context, the role of community pharmacies has been emphasised aiming to facilitate safe disposal of unwanted medicines through advice to and education of customers and acting as an accessible site for returning unwanted or unused medicines, as well as by collaborating with different authorities and waste disposal companies (Kümmerer and Hempel, 2010). Actually, relevant differences have been observed by scholars among countries with regard to the amount of waste collected by pharmacies, the European average ranging from 10 to 100g per capita per year (Toma & Crisan, 2018).

Various programmes exist in different countries to collect leftover medicines from the public and dispose of them in an environmentally friendly way (Daughton & Ruhoy, 2011). In particular, the Spanish National Association of the Pharmaceutical Industry (Farmaindustria), aiming to improve the sustainability of the pharma industry, created a not-for-profit association, SIGRE, in 2001 for the collection and disposal of unused and expired drugs and packages. SIGRE is the result of a group effort between manufacturers, wholesalers and community pharmacies (SIGRE, 2020). Despite most pharmacies in Spain offering this service, a study performed in 2008 concluded that the total amount of drugs collected by the system was small (Coma et al., 2008). The main motive for drug non-use in this study was that the treated condition had improved and there was no further need for the drug.

Drug wastage represents a significant cost for the health care system, as well as for individuals and the environment (Coma et al., 2008; West, Diack, Cordina, & Stewart, 2014). It is important to note that Spanish pharmacies provide medicines in package sizes that are often bigger than required as they dispense drugs in the original package produced by the pharmaceutical industry. Further to this, by adopting green procurement strategies, pharmacists can influence the environmental performance of upstream suppliers (i.e. ecological product design) and collaboration on operational management can result in minimised expired medication (Xie & Breen, 2012).

2.3.2. Socio-economic sustainability in community pharmacies

Another relevant way in which pharmacies can enhance the sustainability of the national healthcare systems is by informing and advising customers on the proper use of drugs. Indeed, despite that, at a very traditional stage the role of community pharmacies was limited to preparing and selling medicinal drugs, during the 20th century it evolved towards a more patient-oriented practice. More recently, pharmaceutical practice has progressed to a clear emphasis on the patient’s welfare (Hepler, 2004) and medication related consultation services by pharmacists are gaining relevance. This makes social sustainability issues increasingly relevant. Nevertheless, the great majority of extant research on sustainability, particularly in the health sector, focuses on the environmental dimension and very few efforts have been done in this domain beyond legislative issues or human safety (Khan et al., 2018). That being said, as stated by Khosravi and Izbirak (2019) (2019), the social sustainability of healthcare is central as it has a strategic influence on the quality of life of local communities. In fact, any organisation aiming to become truly sustainable needs to integrate social sustainability concerns in the same way as environmental or economic concerns (Stephen, 2004). Furthermore, although social sustainability has been considered less important in supply chain management, Mani et al. (2018) state that social sustainability increases the efficiency of the supply chain which holds true for national health systems.

Additionally, as stated by Kaminsky and Jaervnick-Will (2015), it is important to differentiate the internal social sustainability dimension (which includes human resources management, organisational design and change management) from external issues (including relationships across organisations). Internal aspects aim to secure human and social factors within the organisation, while external aspects affect outer stakeholders. Existing research on the social dimension of sustainability in the context of community pharmacies is, however, very limited and empirical studies are urgently required to assess the internal and external aspects of pharmacy work from the viewpoint of social sustainability (Nazar & Nazar, 2019).

Lastly, as stated by Cavicchi and Vagnoni (2020), the economic dimension of sustainability for community pharmacies can be explicited through their managerial and health orientation. Despite operating within a highly regulated environment, pharmacy owners and managers are now at the front of increasing competitiveness decreasing margins and, thus, face the need of reinforcing tasks such as marketing and innovation, human resources and relational skills, among others.

2.4. COVID-19 outbreak

In the context of the COVID-19 outbreak the roles and responsibilities of community pharmacists have been re-examined to help in relieving pressure on health services (Hedima et al., 2020). In the time of the pandemic pharmacists have been the most accessible healthcare professionals to the general public and, hence, their role as informants and advice providers to customers has become pivotal, together with the early virus detection role and referral of suspect cases (FIP Health). When given the resources and permission, community pharmacies have proven to be able to successfully offer critical advanced services (Maidment et al., 2021) Furthermore, in several countries (e.g. Australia, the US, the UK) pharmacists have been authorised to administer SARS-CoV-2 vaccines, as a result of the enhanced frontline public health role of pharmacists in the pandemic (Baratta et al., 2021).
Moreover, according to Zhen et al. (2021), based on the experience of Chinese community pharmacies during the COVID-19 outbreak, in order to provide pharmaceutical care services, community pharmacies need to ensure environment control, staff protection and establish an emergency plan. This implies proper disinfection of the pharmacy environment and/or equipment, provision of staff with effective and sufficient protection gear, establishment of new workflows as well as provision of staff training on COVID-19 prevention, diagnosis and treatment. Despite little data being available still on the effectiveness of protective measures put in place in during the pandemic in pharmacies, Baratta et al. (2021) conclude in a pilot study that the initiatives undertaken have been effective in halting the spread of the virus.

Scholars agree on the fact that community pharmacies have a vital role to play in response to COVID-19 and innovative and extended methods of pharmacy practice are needed as a result of the pandemic (Cadogan & Hughes, 2020; Zheng et al., 2021). Austin & Gregory (2021) highlight opportunities related to task-focus work organisation; (Cadogan and Hughes, 2020) reinforce the role of technology, while Carico et al. (2021) focus on pharmacists’ communication skills.

COVID-19 can push pharmacies forward, accelerating the shift towards more patient centred healthcare relationships at the same time as reinforcing the need of expanding services such as home delivery of prescriptions (Nadeem, Samanta, & Mustafa, 2020). A study performed in May 2020 quantified the protective measures against COVID-19 adopted by Italian pharmacies. This study showed that 87.5% of community pharmacies in Italy had placed protective barriers, 85% had introduced customer input reduction rates and 68% had implemented other forms of social distancing measures in-house (Cabas et al., 2020). In the Netherlands, also in May 2020, a survey by (Koster, Philbert and Bouvy, 2020) showed that pharmacy actions in response to COVID-19 were mainly focused on reducing direct contact with customers and limiting the number of customers in the store. In this research, 93% of pharmacies had placed plastic screens at the counters and approximately 50% stated their intention to maintain these after the pandemic. This is despite Koster et al. arguing that this can negatively influence interaction of pharmacists with patients. Additionally, a similar study in Australia showed that 81.2% of community pharmacies were promoting non-cash payment methods, 77% had removed communal pens and 34.3% had reassigned job tasks to high risk staff (Sum & Ow, 2020). Finally, home delivery was available in 49.1% of community pharmacies during the initial period of the pandemic in a survey performed in Egypt (Bahlo & Dewey, 2020), and in 47% of pharmacies in the Netherlands (Koster et al., 2020). In summary, it has been argued that, during the COVID-19 pandemic, community pharmacists held a key role in preventing the spread of the virus through proper detection, referral and management of possible cases and customer education (Amariles et al., 2020), as well as by being “readily adaptive to changes required” (Oi Lam Ung, 2020, p. 585). Indeed, amid a health crisis, pharmacists need to adapt and respond with innovative ideas to protect the communities they serve (Sum & Ow, 2020).

Undoubtedly, the practice of pharmacy has been significantly disrupted as a result of the pandemic. This disruption occurred literally from one day to the other, requiring pharmacists to adapt in no time. According to Jambulingam et al. (2005), organisations will respond better to unstable environments when they possess intangible resources such as pro-activeness (which is referred to as the ability of a firm to anticipate and act on future needs), and innovativeness (which reflects how the firm anticipates and acts on future needs); Jambulingam et al., using data from the retail pharmacy industry, conclude that such organisations will develop new services that will create sustainable competitive advantages. Certainly, pharmacists use diverse long-term corporate strategies to stay competitive over time. It is argued that sustainability considerations should be embedded in these strategies to build more resilient community pharmacies. Indeed, by reducing their environmental externalities and reinforcing their community impacts, pharmacies may develop a more loyal client base and achieve a more stress-resistant workforce, thus improving their own corporate resilience in light of future health crises.

### 3. Methods

Due to the exploratory nature of the study, a mixed methods research approach was adopted (Creswell, 2014). To this end, the study was carried out in two stages. First, six in-depth, individual interviews were conducted in March 2020 with community pharmacy owners and managers in Barcelona, Catalonia, Spain. A purposive sampling technique was used and participants were interviewed using a semi-structured interview design. Each interview lasted around 30 minutes. Owing to the complex situation at the time due to the acceleration of the pandemic, although the first two interviews where performed face to face, the rest were performed by telephone. Adaptation in the data collection was hence required, as described by Torrentira (2020). For the purpose of this study, interviews were exploited to obtain a list of sustainability practices implemented by community pharmacies in Spain, and reveal the measures adopted by community pharmacies following the COVID-19 health crisis. The topics were tackled using open questions. As a result, a short-list of sustainability practices potentially executed in community pharmacies, as well as a list of the preventative and protective measures adopted in response to the COVID-19 crisis were obtained. Building on the results of interviews, a survey instrument was designed for primary data collection. To this end, a self-completion questionnaire was developed to be filled in by the owner or top management staff of community pharmacies in Spain.

#### 3.1. Questionnaire design

Questionnaire items were developed aiming to measure the extent to which managers of community pharmacies considered they were devoting resources and efforts to sustainability issues. Furthermore, managers’ interest in applying a suggested list of potential sustainability practices was also measured. The practices were chosen based on an extensive literature review, industry association recommendations as well as on the qualitative part of the study as described above. Finally, as the fieldwork took place during the first stage of the COVID-19 lockdown in Spain, which began on March 14th, 2020, a set of items were included, aiming to measure which preventative and protective measures were already in place as a result of the new health crisis.

The questionnaire, which included 56 items grouped in five sections, was structured as follows: section one included personal and organisational questions, including two questions related to a specific sustainability certificate related to the nationwide drug recycling system (SIGRE) that had been mentioned in the qualitative stage and highlighted in the literature review. In section two, we measured motives and barriers towards the application of sustainable practices with the help of the items proposed by Breen et al. (2017), and asked whether there was someone in charge of sustainability initiatives in the respondent organisations. In section three, we asked about the pharmacy’s engagement towards sustainability and managerial orientation towards the adoption of sustainability practices, using seventeen 5-point Likert scale questions (1 = Strongly Disagree; 5 = Strongly Agree). Herewith, with the help of the items proposed by Derqui et al. (2019), two questions concerning Corporate Sustainability
(CS1 and CS2), four questions concerning Environmental Sustainability (ES1 to ES4), and two questions concerning Social Sustainability (SS5 and SS6). Four other questions were added on Social Sustainability (SS1-SS4), adapted from Martinez et al. (2013). Additionally, five questions measured the entrepreneurial orientation towards sustainability pro-activeness and innovation, as suggested by Doucette and Jambulingam (1999). In section four we suggested different potential sustainability interventions and respondents were asked to grade their interest in applying these in their pharmacies. This section included 18 Likert scale questions, where 1 was “Not interesting at all”, 4 was “Very interesting” and 5 was “This initiative is currently being applied in my pharmacy”. Section five included nine items (COV1-COV9) where participants had to choose which COVID-19-related proposed initiatives they were currently implementing (“yes” or “no”). Herewith, the option “maybe”/“sometimes” was also available. These items were based on the recommendations made by the International Pharmaceutical Federation (FIP Health Advisory 2020) and complemented with those suggested by the participants in the qualitative part of the study. Finally, the questionnaire included one open question (COV10) where participants could elaborate on the COVID-19 measures, explaining whether they were currently implementing any additional measures in response to COVID-19 that had not been previously mentioned. The questionnaire was designed and administered in Spanish but it was subsequently back translated in English for writing up the survey results. A complete English translation of the questionnaire is provided in Appendix 1.

3.2. Survey administration

A self-completion questionnaire was distributed within the period of 25th - 30th March, 2020 by email, using Google Forms as a very convenient online platform amidst the many restrictions during the pandemic, as suggested by Torrentira (2020). The questionnaire had been previously pilot tested on three respondents in order to minimise usability issues. A combination of convenience and snowball sampling procedures were used to distribute the questionnaire. We first sent the link to the survey to a group of 27 pharmacies and asked respondents to refer us to additional ones. Through them, we reached 343 community pharmacies in Spain. The link to the survey was also disseminated through the Social Media whereby it was posted on professional networks of community pharmacies in Spain. The final sample consisted of 95 valid responses. We attribute the low rate of response obtained to the extraordinary workload in the pharmacies during the initial time of the COVID-19 crisis. This was articulated in the informal feedback received from some survey respondents. It was communicated to all subjects that their answers would be completely confidential and the questionnaire was totally anonymous. All returned questionnaires were coded and analysed using R software for statistical computing.

3.3. Sample profile

Table 1 presents the profile of the survey respondents. A total of 68.4% (n = 65) were pharmacy owners, and 17.9% (n = 17) were employed pharmacy graduates who were in charge of the pharmacy, while the rest held managerial or administrative roles. We used the number of employees as the classification criteria for the size of the pharmacy, being 12.6% (n = 12) firms with one or two employees; 36.8% (n = 35) had 3 or 4 employees; 22.1% (n = 21) had 5 or 6 employees and 28.4% (n = 27) had 7 or more employees. Moreover, 100% (n = 95) were aware of the suggested Sustainability seal, SIGRE, and 71.6% (n = 68) held SIGRE certification.

It is interesting to highlight that while the average number of employees in community pharmacies in Spain is 3.76 (SEFAC, 2016), the average number of employees in our sample was 5.76. This is probably a result of the low penetration in our sample of rural pharmacies which is due to the purposiveness of our sample, as all the initial emails were sent to pharmacists in the city of Barcelona. It is worth highlighting that the total number of pharmacies in Barcelona is 1,026 (COFB, 2021).

4. Results

4.1. Scale Validity

The reliability of the constructs was determined by Cronbach’s alpha values (Table 2), which confirmed the appropriateness of the scales. The values of Cronbach’s alpha and composite reliability for all constructs exceeded 0.70, thus meeting the criteria of internal consistency as suggested by Nunnally (1978). Items ES1 to ES4 confirmed the measure for the Environmental Sustainability (ENVS) profile of the pharmacy while items SS1 to SS6 confirmed the Social Sustainability profile (SOCS). Moreover, items SE1 to SE5 measured the level of proactiveness/innovativeness (INNOV) of the pharmacy. See Table 3 for the values of each dimension.

Factor analysis with principal component analyses and varimax rotation confirmed the unidimensionality of these variables. Factorial loadings from this analysis were then used to compute the composite reliability of all these factors. All the composite reliability indexes were above the critical cut-off points of 0.7.

4.2. Descriptive statistics

a) Motivations & barriers towards sustainability

When asked whether they were currently implementing any sustainability practices, 68.42% (n = 65) of the sample responded positively (item CM1). Top declared motivations to do so were to “minimise the environmental footprint of the business” (76.5%), “to minimise waste” (53.1%), and to “increase efficiency” (49%). Interestingly, only 10.2% mentioned “to increase customer satisfaction” as a motivation. With regard to the declared barriers, 83% mentioned lack of time to dedicate to this kind of initiatives. It is worth highlighting that only 3.1% of the participants stated lack of interest as a barrier.

b) Sustainability Profile

We described the pharmacies by measuring perceived sustainability performance (items CS1 and 2), as well as by the ENVS and SOCS constructs. When asked whether the participants perceived

| Respondent’s Role        | Size (#Staff) |
|--------------------------|---------------|
| Owner (pharmacist)       | 68.4%         | 1-2 employees | 12.6% |
| Staff pharmacists (non-owners) | 17.9%        | 3-4 employees | 36.58% |
| Assistant                | 6 %           | 5-6 employees | 22.1% |
| Technician               | 3 %           | > 7 employees | 28.4% |
| Administration           | 2 %           | Average number of employees | 5.76 |
| Management               | 3 %           |               |       |
the pharmacy as having a clear strategy on sustainability (item CS1), respondent’s average grade was 3.08, showing that community pharmacy owners/managers’ perception of the sustainability performance of their firms is neither high nor low. Moreover, when asked to what extent they perceived their pharmacy to be more sustainable than other pharmacies, the resulting mean was 2.91. Moreover, only 12.6% (n = 12) community pharmacies stated having a person in charge of environmental initiatives.

Means scores of actual perceived sustainability performance declared (section 3 of the questionnaire) were above 3 in both social and environmental dimensions of Sustainability. Results show that participants rate the Social Sustainability construct (SOCS mean = 4.03) higher than Environmental Sustainability (ENVS mean = 3.76), as shown by Table 3. A Wilcoxon comparison test was performed to ensure that the difference was significant (p-value = 0.001). We can conclude, thus, that pharmacists in Spain prioritise social issues over environmental ones. This is probably due to the lack of awareness of the environmental issues related to their business. It is worth highlighting that the items related to personnel management (SS1, SS2, SS4) clearly outstand the rest.

Each of the aspects with the lowest score highlights areas of opportunity for managers on the path towards offering a more sustainable service: i.e. minimising the environmental footprint or improving lives of the most vulnerable (engagement with the community).

Finally, with regard to the pharmacy’s managerial orientation, no distinctive items were found, which is coherent with the high alpha value of the construct.

c) Rate of adoption and interest in the suggested sustainability practices

A list of specific sustainability practices was suggested to participants in section 4 of the questionnaire, asking them to rate, from 1 to 4, their interest in applying these in their pharmacy and to mark with a 5 if the practice was already in place.

Among the initiatives most frequently already applied were the use of LED lighting technology (S8 = 74.74% “currently applied”), the promotion of drug recovery (S6 = 62%) and (more) rational use of drugs (S7 = 58%). The former ratio could be explained by economic/saving issues, while the latter two are consistent with the raison d’être of pharmacists and could also be related to the recurrent public awareness campaigns performed by the SIGRE Association and the Spanish government, respectively.

Interestingly, we found several other initiatives that were widely implemented (over 50%) “currently applied”, such as the use of paper or biodegradable bags (S2), proper storehouse organisation (S12) and waste management (S11). However, the rate of implementation of all other suggested practices was below 50%. It is particularly striking that only 21% declared going for procurement of products that were more environmentally-benign (item S4). Furthermore, only 11% of the sample declared to currently going for products with a more sustainable packaging than their competitors (item S17) and 18% stated utilising bio or eco products (item S18), from which we infer that green procurement is still an underdeveloped area in community pharmacies in Spain. Still, it is interesting to note that many of these initiatives with low currently applied ratios generate a high interest among the respondents. This is the case for environmentally friendly product procurement (S4), sustainably packed products (S17) and bio or eco products (S18), as shown in Fig. 1. Worth highlighting is the low interest generated by the use of electronic price tags (S1) and the purchase of environmentally friendly clothes and shoes for the staff (S16).

d) COVID-19 preventative and protective measures

In the last section of the questionnaire, we asked respondents about the preventative and protective measures adopted in course due to the COVID-19 crisis. Results show that a high percent-
The frequency of protective initiatives implemented during the COVID-19 pandemic is detailed in Table 4. Measures such as the provision of protective materials to staff (COV3) and daily disinfection of all surfaces potentially exposed to customers (COV6) were widely adopted. The pharmacy’s response to the pandemic was also reflected in the installation of screens and the availability of hand sanitizer (COV5). However, the implementation of initiatives was not uniform across pharmacies, with some showing greater adoption of initiatives related to hygiene and safety, such as the provision of masks and gloves (COV2) and the development of protocols to avoid contact (COV4).

As the pandemic progressed, pharmacies had to adapt quickly to changing circumstances. The implementation of social distancing measures (COV1) was also monitored, with some pharmacies offering home delivery to customers in high-risk groups or with reduced mobility.

4.3. Differentiating Features among Pharmacies

Study participants relate sustainability strategy to environmental measures rather than to social initiatives: we found a good correlation (r = 0.53) between the perception of having a clear and consistent sustainability strategy (item CS1) and environmental sustainability (ENVS). Correlation between CS1 and social sustainability (SOCS) was weaker (r = 0.34).

A Kruskal-Wallis test was conducted to evaluate the differences in the measures adopted against COVID-19 among pharmacies with different sustainability profiles. No significant differences were found in the measures suggested against COVID-19 related to the sustainability profile of the pharmacy (ENVS and SOCS constructs), probably due to the urgency of the situation, and because most of the initiatives suggested were more related to the immediate availability of means at that time (i.e., screens, prevention materials for staff, etc.) than to its sustainability profile. That being said, the item related to home delivery (COV1) was distinctive. Comparing the provision of home delivery with innovativeness (Yes = 4; Occasionally = 3.4; No = 2.6), most innovative pharmacies have offered home delivery to their customers to a higher extent than the rest (chi-squared = 11.899, df = 2, p-value = 0.002881). Likewise, comparing home delivery provision with the social (Yes = 4.5; Occasionally = 4.06; No = 3.83) and the environmental sustainability profile of the pharmacy (Yes = 4.00, Occasionally = 3.75 No = 3.88), socially sustainable pharmacies (chi-squared = 19.069, df = 2, p-value = 0.0001) have offered home delivery to a greater extent, while environmentally sustainable pharmacies (chi-squared = 2.2576, df = 2, p-value = 0.0234) have not.

Besides, results show that both socially sustainable and environmentally sustainable pharmacies are taking significantly more initiatives adding to the ones listed in our questionnaire (higher % of answers in the “other” category), from which we can infer that the more sustainability practices are undertaken, the more diverse
measures against COVID-19 beyond those suggested in the questionnaire were adopted (answers to the open question). Most innovative pharmacies also have a higher rate of “other”. Similarly, pharmacies that rank higher in Sustainability in General (“we have a clear sustainability strategy” and “we are beyond other pharmacies”) have a higher % of yes in “other” initiatives too.

With regard to the pharmacy size, we found a relevant difference: comparing the pro-activeness/innovativeness profile measures between small and large pharmacies (less than 6 employees = 3.4; 7 or more employees = 4.2) a Kruskal-Wallis test also gives significant differences (chi-squared = 19.265, df = 4, p-value = 0.000697), showing that larger pharmacies are more innovative than small ones.

5. Discussion

Our results are consistent with the literature regarding the main motivators and barriers towards the adoption of sustainability practices in the healthcare sector (Breen et al. 2017). Pharmacy owners and managers are most attracted to introduce sustainability-oriented measures that minimise waste, increase operational efficiency and reduce costs, while they allege lack of time as the key barrier. Consistent with Schaper (Schaper, 2002), who found a relationship between retail pharmacies in Australia whose owners/managers had greater time resources and their environmental performance, time constraints were mentioned in our study as the main barrier to improving sustainability performance. Thus, Spanish pharmacies consider sustainability management as a time-consuming issue.

Furthermore, results confirm that intangible resources such as pro-activeness and innovativeness (Jambulingam et al., 2005) facilitate building more engagement with customers which can result in the creation of sustainable competitive advantages. To this end, the most innovative pharmacies in our study had adopted home delivery to a higher extent than the rest of the sample. This is at the same time as they had adopted a wider range of preventative and protective measures in response to COVID-19.

Regarding the preventative measures adopted by community pharmacies, our study shows similar ratios of implementation for most preventative initiatives to previous research (e.g. Bahlol & Dewey, 2020; Cabas et al., 2020; Koster et al., 2020; Sum & Ow, 2020). Thus, we agree with Oi Lam Ung (2020) and Amariles et al. (2020) who highlight the role of pharmacists in the prevention of the spread of the virus.

Finally, a study on the extent of adoption of sustainability practices was performed among primary and secondary schools in Spain showing a higher orientation towards environmental sustainability than towards social sustainability (Derqui, Grimaldi, & Fernandez, 2019) which is opposite to the findings of the present study among community pharmacies. This can be partially explained by the persistent public environmental campaigns that take place in Spain addressing schools, often related to the distribution of public funding while, to the best of our knowledge, there are no similar campaigns or funds addressing community pharmacies.

6. Conclusions

This study focused on the sustainable practices currently adopted by pharmacists and their response to the COVID-19 crisis. Despite the significant role played by retail pharmacies as a key element of the pharmaceutical industry supply chain, there is scant research on their sustainability activities and performance. Aiming to shed light on this gap in the literature, we perform an exploratory study of sustainable practices of community pharmacies in Spain, in the context of COVID-19. Scarce extant studies focus on the environmental dimension of sustainability, and little is found in the literature regarding the social pillar, which, on the other hand, has undoubtedly gained relevance in the context of the current pandemic. We have found no previous research on the relation between sustainability practices and COVID-19 preventative measures.

The results of this study strongly support that, despite the declared focus of pharmacists on improving the disposal of expired or unused medicines and promoting the rational use of drugs to consumers, there is room for improving sustainability performance of the pharmacy supply chain. On the one hand, for instance, green procurement practices represent an area of management that pharmacists only rarely consider. It is worth highlighting that green procurement triggers strong interest despite very few pharmacies currently applying it. This may be linked to the fact that pharmacists do not perceive demand from their customers towards a more sustainable service, which may at least partially explain why most environmentally related practices beyond drug recovery are not prioritised. On the other hand, despite the focus of pharmacists on internal social sustainability measures (i.e. personnel related issues), engagement with the community could be improved.

With regard to sustainability facilitators, the strong relationship between the concept of sustainability and environmental issues explains participants broadly mentioning reducing the pharmacy’s environmental footprint and minimising waste as the main motives to implement sustainability initiatives. Cost reduction motivation may be related to the high penetration of LED lighting which is also considered to be “green”. It is interesting to note that price was not mentioned at all as a barrier to the implementation of sustainability practices. Through insights from the interviewees, it seems that only sustainability initiatives that reduce costs or that are closely linked to the essence of healthcare provision are widely implemented. Thus, it can be concluded that increasing awareness of the environmental issues, together with cost saving opportunities, would comprise central facilitators when aiming to improve sustainability performance in community pharmacies. The industry and government should perform informative campaigns addressing community pharmacists, aiming to increase their awareness of the environmental impact of healthcare. On the other hand, external social sustainability measures offer room for improvement too.

Owing to the urgency provoked by the COVID-19 outbreak and the lockdown imposed by the Spanish government, pharmacies responded with the implementation of diverse preventative and protective measures, most of them regardless of the sustainability profile of the pharmacy. This can be attributed to the urgency of the situation. That being said, the most sustainability-oriented pharmacies have implemented initiatives other than the ones suggested in a higher proportion than the rest, suggesting that the more sustainability oriented the pharmacy is, the more proactive it will be in the adoption of preventative and protective measures as a reaction to a crisis.

This paper holds important policy and managerial implications. Policy makers should integrate community pharmacies into the design of policies aiming to improve the sustainability of healthcare provision, in Spain and beyond. Research findings strongly support that public/industry awareness campaigns should target community pharmacists regarding the environmental impact of their business beyond drug recovery and waste management. Pharmaceutical firms offering (more) sustainable products and packaging should also address communication campaigns towards pharmacists so that the latter become aware of the important role they play in improving the overall sustainability of the healthcare supply chain by adopting green procurement practices. Pharma firms can also address consumers, through pull marketing campaigns, aiming to increase demand for (more) sustainable products.
This research has some original and new points: it highlights the relationship between sustainability practices in pharmacies and the adoption of measures in response to a health crisis. Moreover, it also highlights low implementation of green procurement practices in community pharmacies in Spain. Lastly, it reveals correlation between the scope of adoption of sustainability practices by pharmacists and the extent of their preparedness for health crises. It is argued that this holds important implications for future management of pharmacies in Spain and beyond, given a clear link between business resilience and corporate sustainability commitment.

This study has some limitations related to the purposiveness of its sample. Most participants were located in the metropolitan area of Barcelona and were, thus, mainly large sized and urban. Another limitation of the survey is that it was self-completed during the very early days of the COVID-19 pandemic, i.e. in the period characterised by uncertainty. The study does not analyse financial performance of pharmacies and, thus, we cannot conclude on the three spheres of sustainability. Future research should tackle the triple bottom line as well as delve into the role of community pharmacies in alleviating the effects of health crisis. Further avenues for future research are represented by the longitudinal analysis of the measures that have been maintained or introduced after several months of the COVID-19 pandemic disruption as well as research on the effectiveness of communication campaigns by pharma industry firms towards pharmacists with regard to sustainable products and services.

Declaration of Competing Interest

The authors declare no conflicts of interest.

Appendix 1

Section 1: Demographics

| ID | Question                                                                 | Rating | Description                          |
|----|-------------------------------------------------------------------------|--------|--------------------------------------|
| I1 | Name of Respondent (not mandatory)                                      |        |                                      |
| I2 | Role                                                                    |        |                                      |
| I3 | Location of the Pharmacy                                               |        |                                      |
| I4 | Number of Employees (Full time)                                         |        |                                      |
| I5 | Do you know SIGRE (sistema integrado de gestión y recogida de envases)? | YES / NO|                                      |
| I6 | Are you certified as eco pharmacy by SIGRE?                             | YES / NO|                                      |

Section 2: Sustainability Motives & Barriers

| CM 1 | Does the pharmacy perform sustainability initiatives of any type? (Environmental, social, economic)? | YES / NO|                                      |
| CM 2 | Which would be your motivation to perform sustainability initiatives?                                         |        |                                      |
|      | To save Money                                                          |        |                                      |
|      | To reduce Waste                                                        |        |                                      |
|      | To become more efficient                                               |        |                                      |
|      | To improve the environmental footprint                                 |        |                                      |
|      | To follow corporate policies                                           |        |                                      |
|      | To do what is good to do                                               |        |                                      |
|      | To satisfy your customers                                              |        |                                      |
| CM 3 | Why wouldn’t you perform sustainability initiatives?                    |        |                                      |
|      | Lack of time                                                            |        |                                      |
|      | Lack of interest                                                        |        |                                      |
|      | Other                                                                   |        |                                      |

(continued on next page)

Section 3: Sustainability Profile & Managerial Orientation

| CS1 | The pharmacy has a clear and consistent sustainability strategy        | (1-5)  |                                      |
| CS2 | The pharmacy is ahead of other pharmacies on sustainability issues     | (1-5)  |                                      |
| ES1 | The pharmacy devotes efforts and resources to minimising its environmental footprint | (1-5)  |                                      |
| ES2 | The pharmacy devotes efforts and resources to reducing energy consumption | (1-5)  |                                      |
| ES3 | The pharmacy devotes efforts and resources to reducing the consumption of paper | (1-5)  |                                      |
| ES4 | The pharmacy devotes efforts and resources to reducing the consumption of water | (1-5)  |                                      |
| SS1 | The pharmacy avoids discrimination by age, religion, race or gender in personnel hiring processes | (1-5)  |                                      |
| SS2 | The pharmacy guarantees safe employment and fair working days.         | (1-5)  |                                      |
| SS3 | The pharmacy guarantees environmental training to the employees in order to promote sustainable communities and life styles. | (1-5)  |                                      |
| SS4 | The pharmacy encourages personnel to take part in both internal and external trainings | (1-5)  |                                      |
| SS5 | The pharmacy collaborates with NGOs or associations for diverse causes. | (1-5)  |                                      |
| SS6 | The pharmacy devotes efforts & resources to satisfy the needs of the most vulnerable or under risk of exclusion. | (1-5)  |                                      |

Section 4: Sustainability oriented initiatives in house

| SI  | Use of electronic price tags to reduce paper consumption                | (1-5)  |                                      |
| S2  | Use of biodegradable or paper bags                                     | (1-5)  |                                      |
| S3  | Use of reusable cloth bags instead of plastic                          | (1-5)  |                                      |
| S4  | Prioritize environmentally friendly product procurement                | (1-5)  |                                      |
| S5  | Prioritize Digital Communication over printed press                    | (1-5)  |                                      |

(continued on next page)
Section 5: COVID-19 Please answer the following questions related to the measures undertaken by the pharmacy as a response to COVID-19 crisis

COV1 The pharmacy is exceptionally offering home delivery to customers in risk groups or with reduced mobility

COV2 We have divided the staff into groups in order to avoid risk of infection among them (i.e. group 1 works Mondays and Fridays, and group 2 works Tuesdays, Thursdays and Saturdays)

COV3 The pharmacy provides the required protective materials to the staff (masks, gloves, hydro alcoholic gel)

COV4 The pharmacy has offered workers belonging to risk groups the option of staying at home

COV5 The pharmacy has installed screens to protect staff and customers

COV6 The pharmacy daily disinfects all surfaces potentially exposed to customers

COV7 The pharmacy has withdrawn measurement devices (i.e. cholesterol) to avoid risk of infection

COV8 The pharmacy has developed a work protocol so that each employee uses a different counter and computer, in order to prevent cross infections

COV9 The pharmacy has withdrawn all testers available to the public, in order to prevent infections

COV10 Has the pharmacy implemented any other measure apart from the previously mentioned ones? If yes, please elaborate

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