

# Proactive Environmental Strategies in Healthcare Organisations: Drivers and Barriers in Italy

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## Introduction

In recent decades, healthcare managers have been required to face the dilemma of how to create the most societal value with shrinking resources (Drummond et al. 2013). “More for less” has arisen as the slogan of the modernisation process of the National Healthcare Systems (NHSs) of the most developed countries (Lega et al. 2012). Recently, the social responsibility of healthcare managers has broadened to include the need to protect the environment (World Health Organisation and Health Care Without Harm 2009). This responsibility has emerged as an urgent issue because healthcare organisations have been progressively acknowledged as significant contributors to environmental damage (Mohrman and Shani 2012). In England, for instance, the NHS has estimated its carbon footprint as 21 million tonnes of CO<sub>2</sub>e per year, the same as that of a medium-sized country such as Estonia or Slovenia (Sustainable Development Unit 2009); US hospitals produce 6,600 tonnes of waste per day (Kaplan et al. 2012), and hospitals are more energy intensive than any other commercial buildings (Singer and Tschudi 2009). Indeed, in many countries, such as the US, Canada, the UK and Sweden, a wide range of greening initiatives have been implemented to improve the capability of healthcare organisations to protect the environment, contain the use of natural resources and incentivise green behaviours among healthcare professionals. As a consequence, at the same time that healthcare managers are still demanded to deliver high-quality, safe and low-cost care to patients, they also must consider their responsibility to reduce their

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organisations' environmental footprints because of the growing pressure from healthcare stakeholders (Jamerton and McGuire 2002; Ulhoi and Ulhoi 2009; Jamali et al. 2010; Mohrman and Shani 2012; Pinzone et al. 2012; Pencheon 2013). However, despite the many initiatives undertaken in the last years, such as energy efficiency, recycling, water conservation, sustainable mobility and green procurement (World Health Organisation and Health Care Without Harm 2009), healthcare managers experience shortcomings in going beyond the minimum legal constraints. In this regard, healthcare organisations were—and still are—“cautious adopters” of proactive environmental strategies (PESs); The Boston Consulting Group and MIT Sloan Management Review 2011; Lynch 2011).

In this regard, past research on the adoption of PESs converged on two main results. One, many studies confirmed that stakeholder pressure is one of the major triggers for an organisation's adopting deliberate, non-mandated environmental strategies (e.g., Delmas and Toffel 2004; González-Benito and González-Benito 2006; Murillo-Luna et al. 2008; Darnall et al. 2010). Two, a growing body of evidence has pointed out that unfavourable organisational features (e.g., a modest commitment from employees) and/or external contingencies (e.g., the ambiguity or complexity of legislation) limit an organisation's environmental proactivity (e.g., Post and Altman 1994; Murillo-Luna et al. 2007; González-Torre et al. 2010; Murillo-Luna et al. 2011).

Notwithstanding the relevance of these previous contributions, three main gaps still limit our understanding of this phenomenon.

First, past research mainly focused on manufacturing organisations and overlooked the generalisability to other relevant contexts such as professional ones. In professional organisations, managers cannot easily mandate changes to current processes, practices and behaviours (Battilana 2011) because professionals have expert knowledge that allows them to be significantly autonomous in both their decision-making and their actions (Abbott 1988; Llewellyn 2001). Professionals might perceive managers' use of limited resources on new and emerging stakeholders (e.g., the environment) as a serious threat to their missions and core values (Jamerton and Pierce 2001). In this view, adopting greening strategies far beyond what is required by the current legislation might exacerbate the clash between managers and professionals. In the case of healthcare, whereas tensions between managers and professionals in recent years have focused on the allocation of limited resources to different groups of patients—but all of them are patients—the adoption of PESs allocates part of these limited resources to other stakeholders, such as the community, rather than to patients.

Second, the empirical evidence gathered by previous contributions on the role of barriers is limited because the

greater part of them were theoretical or based on case studies (Murillo-Luna et al. 2011; Delgado-Ceballos et al. 2012).

Third, past research overlooked the conceptualisation and empirical testing of the interaction between stakeholder pressure and potential barriers (Delmas and Toffel 2011; Delgado-Ceballos et al. 2012).

This study aims at narrowing these three gaps by (i) conceptualising and (ii) empirically testing the interaction between stakeholder pressure and potential barriers to adopting PESs in (iii) a professional context, namely, healthcare organisations.

Based on previous contributions, we replicated the analysis of the direct relationship between stakeholder pressure and PESs and between barriers and PESs in the healthcare context, but we also extended the findings of previous studies by developing and empirically testing the interconnection of stakeholder pressures, barriers and adopting PESs.

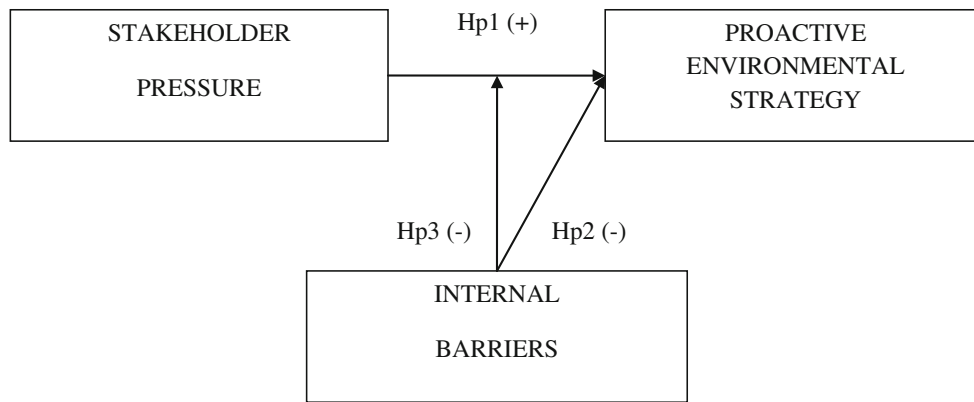
In doing so, we make three main contributions to our current understanding of PESs.

First, we contribute to shedding first light on the adoption of PESs in healthcare organisations. Previous research has mainly focused on industrial sectors and private firms, but little attention has been paid to the drivers and barriers that affect PESs in service sectors, such as healthcare, and public organisations (Etzion 2007; Rueda-Manzanares et al. 2008).

Second, our study provides both scholars and practitioners with new insights on the role that barriers play in the adoption of PESs. We extend previous findings by van Hemel and Cramer (2002) and by Murillo-Luna et al. (2011), providing new empirical evidence on the barriers (van Hemel and Cramer 2002) that significantly prevent organisations from adopting the desired proactive practices (i.e., “no-go” barriers) and the barriers that complicate and thus slow the adoption without impeding it (i.e., “initial” barriers).

Finally, our study advances previous studies because it examines the simultaneous influences of stakeholder pressure and barriers on PESs. Testing the negative moderating effect of barriers on the relationship between stakeholder pressure and PESs, we shed new light on why healthcare organisations develop different responses even when they are exposed to the same levels of stakeholders' pressure.

Altogether, our study paves the way for a better understanding of why healthcare is less proactive than other sectors in developing sustainability-oriented strategies (The Boston Consulting Group and MIT Sloan Management Review 2011) and offers first indications of how to accelerate the capacity of healthcare organisations to meet their broadened social responsibility regarding resource use.



**Fig. 1** Theoretical framework

The paper is structured as follows. In the first section, we present the literature that informs our conceptual framework and the hypotheses that will be tested. Then, we illustrate our methodology. The “Results” section shows the findings from the empirical analysis. Finally, we discuss our contributions to both theory and practice, illustrate the limitations of the study, suggest directions for future research and draw our conclusions.

### Theory and Hypotheses

Our theoretical framework is presented in Fig. 1 (control variables are not displayed). We suggest that there is: (i) a direct positive relationship between the pressure exerted by stakeholders on environmental matters and adopting PESs (Hp1), (ii) a direct negative relationship between internal barriers and developing PESs (Hp2), and, (iii) a negative moderating effect of internal barriers on the relationship between stakeholder pressure and PESs (Hp3). In the following, we will contextualise the main conceptual blocks of our framework (i.e., PESs, stakeholder pressure and internal barriers) in the current academic debate and develop our hypotheses on the basis of theory and previous research. First, we present the relevant literature on PESs (our dependent variable); then, we note the role of stakeholder pressure in driving the adoption of PESs; finally, we discuss the direct and indirect role that internal barriers play in impeding the development of PESs.

#### Proactive Environmental Strategy

Companies’ proactivity towards the environment is a research topic that is attracting considerable research attention within the broader debate on companies’ behaviour in relation to societal issues (Lee 2008; Lamberti and Lettieri 2008). In his seminal paper on *Corporate Social Performance*, Carroll (1979, p. 500) argued that

organisations’ social responsibility consists of “the economic, legal, ethical, and discretionary expectations that society has of organisations at a given point in time”. This article pointed out that, while the economic, legal and ethical responsibilities are clearly codified or commonly expected by society, discretionary responsibilities are neither mandated nor expected by stakeholders with the same degree of moral force as does the ethical ones. In this view, discretionary responsibilities are dependent on the organisation’s voluntarily adopting a leading role in addressing societal issues. Examples include philanthropy, community programmes and employee voluntarism (Carroll 2000; Carroll and Shabana 2010), which are the result of voluntary commitments companies can make in order to positively contribute to achieving societal goals (Jamali and Mirshak 2007).

In addition to companies’ social responsibilities, Carroll (1979) discussed companies’ social responsiveness—i.e., the degree and kind of response they give to social issues and expectations—and identified four strategies of action that evolves along a *continuum* ranging from reaction to proactive responses.

Consistent with this framework, researchers in the environmental domain have investigated organisations’ strategies in addressing their discretionary responsibilities towards the environment, and, in particular, they have focused their attention on organisations’ adoption of PESs—defined by Sharma and Vredenburg (1998, p. 733) as “a consistent pattern of environmental practices, across all dimensions relevant to their range of activities, not required to be undertaken in fulfilment of environmental regulations or in response to isomorphic pressures within the industry as *standard business practices*”.

Drawing on Carroll’s (1979) model, past studies debated how organisations should be clustered according to their level of action towards the environment. In this regard, Henriques and Sadosky (1999) argued four distinct groups: (i) reactive organisations, which do not have

environmental plans in place beyond what the legislation requires; (ii) defensive organisations, which have environmental plans that are not formalised or diffused within the organisation itself; (iii) accommodative organisations, which have formal environmental plans that are clearly communicated to employees; and (iv) proactive organisations, which have in place an exhaustive set of environmental practices that are pursued with full commitment. Buysse and Verbeke (2003) identified three clusters: (i) reactive organisations, which are characterised by an end-of-pipe approach to environmental issues; (ii) organisations with a pollution prevention strategy that shows limited development of green competencies in product and manufacturing technologies; and (iii) environmental leaders, which have the strongest environmental management practices in place. Murillo-Luna et al. (2008, 2011) proposed four categories: (i) passive organisations, which devote little attention or effort to environmental issues; (ii) organisations that pay attention to legislation, characterised by those practices that only guarantee compliance with the laws; (iii) organisations that pay attention to stakeholders and that invest time and resources in environmental protection measures that go beyond what is prescribed by law; and (iv) organisations with a total environmental quality strategy, which have environmental protection as an overarching goal in all of their activities.

Despite the differences, all classifications endorse the existence of a *continuum* in organisations' response to environmental issues that ranges from the most reactive attitude towards the environment to the most proactive one (González-Benito and González-Benito 2006; Murillo-Luna et al. 2011; Delgado-Ceballos et al. 2012). On the one hand, the most reactive strategies have been mainly characterised by mere compliance with regulation (Aragon-Correa and Sharma 2003; Murillo-Luna et al. 2011; Delgado-Ceballos et al. 2012) and adoption of end-of-pipe technologies (Sharma and Henriques 2005). On the other hand, environmentally proactive organisations have been described as using voluntariness and anticipation rather than reaction (Garcés-Ayerbe et al. 2012) and prevention rather than correction of pollution (Murillo-Luna et al. 2011) and as performing a full set of environmental activities, grouped by González-Benito and González-Benito (2006) into planning and organisational practices (e.g., environmental policy, environmental training for employees), operational practices (e.g., use of clean technologies, environmental criteria in supplier selection) and communication practices (e.g., environmental reporting).

#### Stakeholder Pressure for the Adoption of PES

Stakeholders are those individuals and groups that can affect an organisation's performance or are affected by an

organisation's actions (Freeman 1984). Stakeholder pressure has been extensively found to represent a significant stimulus for organisations to embrace environmental practices (Henriques and Sadowsky 1999; Buysse and Verbeke 2003; González-Benito and González-Benito 2006; Murillo-Luna et al. 2008; Sarkis et al. 2010; Garcés-Ayerbe et al. 2012).

Previous studies have been developed different taxonomies to classify the stakeholders that can exert pressure on an organisation to adopt proactive behaviours in relation to societal issues (such as greening strategies). In this regard, Lamberti and Lettieri (2008) reviewed the most relevant contributions. Although we agree with their analysis and conclusions, we elected in this study to narrow the scope of our search by referring only to past contributions that specifically addressed organisations that had adopted more responsible behaviours towards the environment. In this view, Henriques and Sadowsky (1999) differentiated among: (i) regulatory stakeholders (e.g., governments, trade associations), who can impose regulations and standards of environmental practices and technologies; (ii) organisational stakeholders (e.g., customers, suppliers, employees, shareholders), who influence the organisation's bottom line and can affect the success of environmental activities; (iii) community stakeholders [e.g., nongovernmental organisations (NGOs), social groups]; and (iv) the media, which can influence how citizens perceive different organisations and thus mobilise public opinion in specific directions. Buysse and Verbeke (2003) distinguished between: (i) regulatory stakeholders; (ii) primary stakeholders, which are directly relevant to the organisation's survival and can be both external (e.g., customers, suppliers) and internal to the organisation (e.g., employees, shareholders); and (iii) secondary stakeholders (e.g., rivals and environmental NGOs).

Against these stakeholder classifications by their nature, Sharma and Henriques (2005) argued for a classification in terms of how stakeholders affect organisations' strategies. In this view, on the basis of the resource interdependences between the organisation and its stakeholders, they claimed that stakeholders can influence organisations' environmental protection decisions through "direct" and "indirect" as well as "withholding" and "usage" strategies. Accordingly, stakeholders can directly or indirectly influence the flow of resources to the organisation, and they can apply "withholding" strategies, determining if an organisation obtains a resource, or they can adopt "usage" strategies, attaching conditions to the supply of their resources. Continuing in this direction, past research provided empirical evidence on how stakeholder pressure affects the adoption of PESs. In this regard, two distinct approaches have been used in previous studies (Garcés-Ayerbe et al. 2012). In the first approach, some researchers

argue that organisations design their environmental strategies in an attempt to respond to those groups of stakeholders whose needs are perceived as the most relevant (e.g., Henriques and Sadorsky 1999; Buysse and Verbeke 2003; Sharma and Henriques 2005). In this view, the different groups of stakeholders and their impacts on the organisations are investigated separately. The other approach is based on the growing, empirically based consent in the literature that organisations “face a single demand function for environmental protection” (Murillo-Luna et al. 2008, p. 1238), meaning that organisations do not react differently to different groups of stakeholders, but when they perceive pressure on environmental matters from one of them, they begin to perceive pressure from the others; thus, the proactivity of the strategy does not depend on the origin of the pressure but on its intensity (e.g., Murillo-Luna et al. 2008; Rueda-Manzanares et al. 2008; Sarkis et al. 2010; González-Benito et al. 2011; Sprengel and Busch 2011; Garcés-Ayerbe et al. 2012). This argument is consistent, one, with previous findings by Henriques and Sadorsky (1999), who reported that managers in environmentally proactive organisations perceived all stakeholders—except the media—as salient, and two, with findings by Sharma and Henriques (2005), who stated that some groups of stakeholders can exert joint indirect pressure by leveraging more powerful stakeholders to influence organisations’ environment-related behaviours.

The second, more recent, approach by Murillo-Luna et al. (2008) is more consistent with the main purpose of this study because we are mainly interested in the overall effect of the intensity of stakeholder pressure on healthcare organisations’ adopting an approach to environmental issues that goes far beyond mandatory requirements. In particular, we chose to investigate this linkage regardless to the specific actions implemented to address the concerns of specific groups of stakeholders, such as the adoption of a particular green technology or the selection of a specific environmental certification. The limits of this choice will be discussed in the “Limitations and Directions for Future Research” section.

Therefore, on the basis of arguments from past research and of our choice to take the second approach, we propose the following hypothesis:

**Hp1** Stakeholder pressure positively affects the adoption of PESs.

### Internal Barriers to the Adoption of PES

Environmental barriers account for factors that may discourage organisations from adopting PESs (Murillo-Luna et al. 2011). Extant research on environmental barriers (e.g., Post and Altman 1994; Hillary 2004; Murillo-Luna

et al. 2007, 2011; Chan 2008; Walker et al. 2008) has identified two main categories of these barriers: external and internal. External barriers, also called industry barriers, are related to the type of business activity in which firms are engaged (Post and Altman 1994) and cannot be directly controlled by the organisation (Murillo-Luna et al. 2011). In contrast, internal barriers refer to organisation-specific factors (Murillo-Luna et al. 2011). Because in this study we focus our attention on a single industry, we can only examine the effect of internal barriers, which, however, have been highlighted as having a greater negative impact on the development of PESs than external barriers (Post and Altman 1994; Hillary 2004; Murillo-Luna et al. 2007; Dahlmann et al. 2008).

The still-active debate about internal barriers is converging towards identifying the particular factors that, more than others, might completely inhibit or delay the adoption of PESs (Murillo-Luna et al. 2011). In particular, they refer to three groups of factors.

First, scarcity of financial resources prevents organisations from investing in green technologies and assets and from hiring qualified human resources for environment-oriented activities (Hillary 2004). The consequence is a limited capacity to change current processes, practices and behaviours towards those that could reduce environmental impacts and the consumption of non-renewable resources (Chan 2008).

Second, organisations can be limited by the absence of strategic capabilities, such as (i) insufficient commitment from top management (Murillo-Luna et al. 2007; Chan 2008), who may perceive other demands as more relevant and urgent; (ii) lack of a sound business case for the benefits and costs of environmental initiatives (Walker et al. 2008); and (iii) limited innovation skills (Murillo-Luna et al. 2011).

Third, employees who are not fully committed to change towards greener processes, practices and behaviours because of their limited understanding of the “why” and the “how” this transition should occur may initiate resistance to change and hamper the change process needed to introduce environmental practices (Hillary 2004; Murillo-Luna et al. 2007, 2011; Walker et al. 2008).

Despite the value of research’s having crystallised the most significant internal barriers, considerable uncertainty still remains on how intensively these barriers affect the adoption of PESs (Murillo-Luna et al. 2011). In this regard, a pioneering contribution by van Hemel and Cramer (2002) argued the distinction between “no-go” and “initial” barriers with regard to their intensity. In their view, organisations that choose to adopt PESs face two distinct types of barriers. “No-go” barriers constitute hurdles that organisations are likely to fail to overcome, and their existence thus keeps proactive environmental practices from being

implemented. “Initial” barriers are hurdles that slow and complicate the adoption of environment-oriented initiatives, but in the end they will be adopted. Murillo-Luna et al. (2011) brought quantitative evidence that among the internal barriers, budgetary limitations and modest capability to change are likely to act as significant “no-go” barriers—and thus to have a direct, negative impact on adopting PESs. Other types of barriers do not have this direct, negative effect, but they can reduce the likelihood of adopting PESs through indirect causal mechanisms, such as through reducing the organisation’s capacity to absorb, respond to or even anticipate stakeholders’ environmental demands (González-Benito and González-Benito 2006).

Therefore, based on these arguments from past research, we expect that the presence of internal barriers has both a direct and an indirect effect on adopting PESs. As a corollary, we state the following hypotheses:

**Hp2** The existence of internal barriers negatively affects adopting PESs.

**Hp3** Internal barriers moderate the relationship between stakeholder pressure and adopting PESs; specifically, the greater the barriers, the smaller the effect of stakeholder pressure on PESs.

## Methodology

### Participants and Procedures

Our study’s sampling frame consisted of 462 healthcare organisations, which corresponded to the population of Italian healthcare organisations in the most inhabited regions in north-central Italy (i.e., Piedmont, Lombardy, Veneto, Emilia Romagna and Tuscany). This threshold was chosen to balance the feasibility of the study and the need for a sufficiently large sampling frame.

Because there were no publically available data on the topics covered in our study, we designed an ad hoc questionnaire (“Appendix” section) that was administered to medical directors by the first author between April 2012 and June 2012. This research design took into account two factors. On the one hand, previous studies in healthcare acknowledged the significant decrease in response rates when two or more respondents from the same organisation are involved. In this view, the trade-off is between containing the potential for common method variance (CMV; Podsakoff et al. 2003) and the number of collected observations.

On the other hand, medical directors are the only professionals who are knowledgeable on each of the three variables in this study, by virtue of their positions (Huber and Power 1985). In fact, medical directors are apical

managers in healthcare organisations; they are responsible—at least in Italy, the research location of this study—for the way clinical and hospitality operations are designed and managed. In this regard, they are fully knowledgeable about the characteristics of their healthcare organisations, the pressure exerted by stakeholders in terms of environmental issues, all of the recent environmental initiatives, and the internal barriers that had to be overcome. Other professionals (e.g., facility managers, business controllers) have—at least in Italy—limited knowledge about stakeholders’ demands regarding the environment, what the healthcare organisation is doing in terms of greening initiatives or the barriers being addressed.

All medical directors who received the questionnaire were informed about our research and its non-commercial goals, the absence of conflicting interests, the analysis of aggregate data and their protection as respondents through anonymity.

A total of 74 questionnaires were returned, out of which 11 were removed because of a high percentage of missing answers, resulting in a final response rate of 13.64 %. Thus, the final sample comprised data from 63 healthcare organisations. This sample is moderately small but in line with previous studies on environmental issues (e.g., Carmona-Moreno et al. 2004; Murillo-Luna et al. 2011) and large enough to test our hypotheses. The healthcare organisations in the sample had an average of 415 beds (SD = 368), and 37 % were privately owned.

In order to address the potential limitations of our survey data, we checked for the existence of non-response bias and took actions in order to minimise the possible effect of CMV.

With regard to non-response bias, comparison tests were conducted to establish whether the cleaned sample systematically differed from the non-respondent healthcare organisations. No significant differences were found in terms of size, ownership or region. We also tested whether early respondents differed significantly from late respondents in the study’s main variables. No significant differences were found for PESs, the existence of internal barriers, or pressure exerted by stakeholders. Consequently, we concluded that the sample accurately represented the population from which it was drawn.

With regard to CMV, following the recommendation of Podsakoff et al. (2003), we used ex ante remedies during the research design stage and also performed ex post tests on the data to evaluate the extent to which CMV might have influenced our empirical findings.

First, before administering the survey, we carefully reviewed the items to ensure that ambiguous, vague or unfamiliar terms were not included. Furthermore, in the questionnaire’s cover letter, we guaranteed respondent confidentiality, emphasised that there were no correct or

incorrect answers and asked respondents to provide independent and honest answers. Additionally, following the suggestion by Podsakoff et al. (2003) to include tailor-made CMV measures in the questionnaire, we elected to control for social desirability bias because the topic of our study was susceptible to this type of bias (Banerjee 2002). We therefore introduced the social desirability scale developed by Strahan–Gerbası (1972) among the items of our questionnaire. Then, before we tested our hypotheses, we conducted Harman’s single-factor test on the key variables of our theoretical model. The outcome of the test showed that there were nine factors and that the highest variance accounted for by one factor was 27.3 %, indicating minimal evidence of method bias (Harman 1967).

## Measures

Our analysis included one dependent variable, two independent variables and multiple control variables. Measures used in this study were adapted from past research. For the multi-item measures, we conducted an exploratory factor analysis (EFA) to examine the dimensionality of the constructs and calculated the Cronbach’s  $\alpha$ s to establish their internal consistency. We did not perform a confirmatory factor analysis (CFA) because of the relatively small size of our sample; CFA requires that more parameters be estimated (e.g., pattern coefficients, error variances and covariances) than does EFA (Kline 2013). Furthermore, our sample did not meet the rule of thumb of the minimum case-to-parameter ratio of 20:1 for CFA. In contrast, the number of observations was sufficient to meet a ratio of 10:1, which is considered acceptable for EFA (Kline 2013).

## Dependent Variable

*Proactive Environmental Strategy* Consistent with previous research (e.g., Henriques and Sadorsky 1999; Murillo-Luna et al. 2008), we measured PESs in terms of the proactivity of the environmental response patterns. Respondents were given a list of environmental practices and asked to indicate to what extent they agreed or disagreed with the affirmations that each specific practice was in place in their organisation. Each item was assessed on a seven-point Likert scale where 1 meant “strongly disagree” and 7 meant “strongly agree”. Following González-Benito and González-Benito (2006), we included items related to planning and organisational practices (e.g., “Environmental objectives are clearly defined in my organisation”), communication practices (e.g., “My organisation periodically reports its environmental performance to its stakeholders”) and operational practices (e.g., “My organisation requires its suppliers to have an environmental certification”).

The EFA showed that a single factor accounted for 53.5 % of the variance in our data, and the Cronbach’s  $\alpha$  of our measure was 0.84, indicating the high reliability of our scale (Nunnally 1978).

## Independent Variables

*Stakeholder Pressure* We adapted the groups of stakeholders identified by Henriques and Sadorsky (1999), Buysse and Verbeke (2003) and Murillo-Luna et al. (2008) to the healthcare context. Our questionnaire included 11 groups: national institutions, regional institutions, local institutions, employees, professional associations, patients, patients’ associations, other healthcare organisations, local communities, suppliers and the media.

Respondents were asked to evaluate the pressure exerted by each group with respect only to the environmental issues. The intensity of each type of pressure was rated on a seven-point Likert-like scale where a value of 1 indicated “extremely low” and a value of 7 indicated “extremely high”.

A single factor explained 71.3 % of the variance in our data as a result of the EFA. This result supports our theoretical assumption that healthcare managers—as do other managers—perceive a unique demand from all stakeholders, concurrent with Murillo-Luna et al. (2008), Rueda-Manzanares et al. (2008), Sprengel and Busch (2011), and Garcés-Ayerbe et al. (2012). Finally, a Cronbach’s  $\alpha$  value of 0.96 confirmed the internal consistency of our measure (Nunnally 1978).

*Internal Barriers* We proposed a set of 14 items based on the literature on internal barriers. Respondents were asked to evaluate each barrier on a seven-point Likert-like scale where 1 meant “not at all important” and 7 meant “extremely important”. We performed an EFA to explore the latent structure of our construct. After performing a varimax rotation to obtain a set of independent dimensions, we found that three factors accounted for 69 % of the cumulative explained variance. The results are reported in Table 1. Consistent with the items they represented, we named the three dimensions as follows: Factor 1: *lack of resources* (i1–i4); Factor 2: *lack of commitment* (i5–i10); Factor 3: *difficulty in evaluating impacts* (i11–i14). All of the  $\alpha$ s had values larger than 0.8, confirming the internal consistency of the three factors identified (Table 1).

## Control Variables

Finally, we took into account a number of control variables from previous studies developing PESs (e.g., González-Benito and González-Benito 2006). We controlled for size because this variable is often associated with greater

**Table 1** Dimensions of internal barriers: principal component analysis

	Lack of resources	Lack of commitment	Difficulty in evaluating impacts
Cronbach's $\alpha$	0.81	0.87	0.86
(1) Limited financial capability for environmental investments	0.771		
(2) Lack of human resources to dedicate to environmental activities	0.793		
(3) High cost of environmental services and technologies	0.807		
(4) Difficulty in protecting the environment without increasing costs	0.685		0.301
(5) Limited knowledge of environmental problems among employees		0.821	
(6) Limited knowledge of environmental problems among directors		0.826	
(7) Limited interest in environmental issues among employees		0.865	
(8) Limited interest in environmental issues among directors		0.857	
(9) Unfavourable attitude of the employees due to other priorities		0.704	
(10) Unfavourable attitude of the directors due to other priorities		0.687	0.355
(11) Difficulties in evaluating the financial benefits of environmental investments			0.712
(12) Difficulties in evaluating environmental activities' impacts on non clinical processes			0.859
(13) Difficulties in evaluating environmental activities' impacts on clinical pathways			0.837
(14) Difficulties in evaluating intangible impacts of environmental activities (e.g., reputation in the community, image as a great place to work)			0.849

availability of resources and higher visibility among stakeholders (Murillo-Luna et al. 2011). Size was measured as the number of beds available in each organisation (Baluch et al. 2013). We also controlled for the geographic location where each organisation operates (one of the five regions included in the study, as discussed earlier) and the type of organisation (differentiating between hospitals, local health authorities and nursing homes). In this regard, we created two categorical variables, one for the geo-graphic location and another for the type of organisation. Furthermore, we asked each respondent to evaluate the profit-and-loss (P&L) accounts for the last 3 years on the basis of a five-point scale ranging from "strongly negative" to "strongly positive". Finally, we controlled for social desirability bias by adopting the 10-item scale developed by Strahan–Gerbasi (1972) because the topic of this study could potentially be susceptible to this type of bias (Banerjee 2002).

## Results

To test our hypotheses, we used a moderated linear regression analysis, introducing the moderating effect as a multiplicative variable. Before creating the multiplicative terms, we proceeded to fix both the independent and the moderating variables on their means to avoid multi-collinearity (Cohen et al. 2003). Additionally, we tested the effect of each internal barrier separately to avoid the risk of high collinearity among the independent variables.

Furthermore, because of the relatively small size of our final sample, a bootstrap of 10,000 subsamples was applied to estimate the statistical significance of the relationships between the proposed variables, with the aim of increasing the robustness of the model (Jabbour et al. 2012). Bootstrapping is suggested for obtaining more accurate inferences when the sample size is small because it does not require distributional assumptions (Hoyle 1999).

Table 2 shows the means, SDs and pair-wise correlations of the continuous variables analysed in our framework, and Table 3 summarises the output of our analysis.

In the first model, we checked the explanatory power of the control variables. In all models, size, P&L accounts and social desirability were not significant, meaning that they did not significantly affect the development of PESs in the studied healthcare organisations. The dummy variable related to hospitals as a type of healthcare organisation ( $\beta = -1.23$ ) was significant at the 0.05 level. However, its significance was not supported in the subsequent models. Finally, the dummy variable for the region Emilia Romagna was found to positively and significantly ( $p < 0.05$ ) affect PESs in every model.

In the second model, we introduced stakeholder pressure. The model showed a remarkable increase of 34 % in explained variance, and the variable remained significant ( $p < 0.001$ ) in all of the subsequent models, supporting our first hypothesis that the greater the stakeholder pressure on environmental matters, the greater the proactivity of the environmental strategy developed by the healthcare organisations.



**Table 2** Means, SDs and correlations of the study variables

Variables	Mean	SD	1	2	3	4	5	6	7	8
(1) Proactive environmental strategy	3.25	1.07	1							
(2) Stakeholder pressure	3.08	1.38	0.63***	1						
(3) Lack of resources	5.49	1.05	-0.08	0.08	1					
(4) Lack of commitment	4.65	1.25	-0.26*	-0.09	0.27*	1				
(5) Difficulty in evaluating impacts	4.95	1.35	-0.05	0.05	0.35**	0.23 <sup>†</sup>	1			
(6) Size	414.76	368	-0.01	0.12	-0.01	-0.02	0.03	1		
(7) P&L accounts	2.79	0.78	0.2	0.02	-0.1	0.11	-0.11	-0.31*	1	
(8) Social desirability	5.95	1.84	-0.03	-0.01	-0.03	0.01	-0.05	0.09	-0.22 <sup>†</sup>	1

$N = 63$

Significant at the: <sup>†</sup> 0.10, \* 0.05, \*\* 0.01, and \*\*\* 0.001 levels

Then, we analysed the effect of the first internal barrier, namely, the lack of resources in models 3 and 4. We found neither a significant direct relationship with PESs nor a significant moderating effect on stakeholder pressure.

The fifth and sixth models tested the role of lack of commitment. Both the direct negative ( $\beta = -0.21$ ) and the negative moderating effects ( $\beta = -0.17$ ) were significant, with a  $p$  value lower than 0.05, indicating that low commitment to environmental issues limited these healthcare organisations' capacities to develop PESs and to fully respond to stakeholders' demands for environmental protection.

The analysis of the barrier "difficulty in evaluating impacts" was carried out in models 7 and 8. In both models, the direct effect of the barrier was not significant, but in model 8, the moderating term ( $\beta = -0.19$ ) result was significant at the 0.01 level.

## Discussion

We developed and tested a model to investigate the adoption of PESs in the healthcare sector. In particular, we looked at the interplay between stakeholder pressure and internal barriers in driving the adoption of PESs by healthcare organisations. We found that stakeholder pressure is positively related to PESs. In addition, we found that, among the internal barriers suggested by previous studies, the lack of employee commitment towards the environment negatively influences the adoption of PESs both directly and indirectly and the difficulty in evaluating the impacts deriving from environmental practices decreases the positive influence of stakeholder pressure on PESs.

These findings have several theoretical and practical implications, which we outline in the followings.

## Contributions to Theory

Our findings contribute to extending extant knowledge on PESs in three ways: (i) focusing on the healthcare sector, they shed light on this phenomenon in a research context that has been overlooked in previous studies; (ii) they offer new empirical evidence on the role of internal barriers in impeding PESs, and (iii) cross-cutting previous research on stakeholder pressure and internal barriers, they provide original empirical evidence of the interplay between stakeholder demand for environmental protection and internal barriers, and allow having a more complete understanding of the adoption of PESs.

First, our findings clarify that stakeholder demand for environmental protection is a significant trigger for healthcare organisations' developing appropriate strategies. In particular, our results indicate that healthcare managers perceive stakeholder demand for environmental protection as a trigger. This finding is fully consistent with what has been found in past research in other industries (e.g., Murillo-Luna et al. 2008) and indicates that managers perceive stakeholders' environmental pressure as a single pressure and that the greater the environmental pressure exerted by stakeholders, the more solutions the organisation tends to adopt beyond the mandatory environmental requirements established by law, and even beyond stakeholder expectations.

Second, our results show that whereas the lack of employee commitment to environmental issue represents a "no-go" barrier in healthcare organisations, the lack of resources and the potential difficulties in evaluating impacts do not have a direct negative effect on adopting PESs.

These results partially differ from what was found by Murillo-Luna et al. (2011), and these differences can be explained by the specificities of the healthcare context.

**Table 3** Results of the regression analysis

Proactive environmental strategy	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Size (bootstrap standard error)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
P&L accounts (bootstrap standard error)	0.21 (0.21)	0.14 (0.18)	0.13 (0.18)	0.11 (0.18)	0.18 (0.16)	0.06 (0.16)	0.14 (0.19)	-0.03 (0.17)
Social desirability (bootstrap standard error)	0.02 (0.07)	0.02 (0.05)	0.02 (0.05)	0.02 (0.05)	0.02 (0.05)	0.02 (0.05)	0.02 (0.05)	-0.00 (0.05)
Lombardy (bootstrap standard error)	0.29 (0.35)	0.16 (0.33)	0.14 (0.33)	0.16 (0.34)	0.14 (0.32)	0.15 (0.31)	0.16 (0.34)	0.34 (0.34)
Tuscany (bootstrap standard error)	0.20 (0.53)	-0.01 (0.39)	0.01 (0.40)	0.03 (0.42)	0.00 (0.32)	-0.23 (0.31)	-0.01 (0.39)	0.16 (0.37)
Piedmont (bootstrap standard error)	0.02 (0.46)	-0.27 (0.38)	-0.27 (0.38)	-0.29 (0.39)	-0.21 (0.34)	-0.39 (0.38)	-0.27 (0.38)	-0.40 (0.36)
Emilia Romagna (bootstrap standard error)	0.84* (0.42)	0.69* (0.34)	0.68* (0.34)	0.69* (0.35)	0.83* (0.32)	0.64 <sup>†</sup> (0.36)	0.69* (0.34)	0.98** (0.36)
Hospital (bootstrap standard error)	-1.23* (0.50)	-0.65 <sup>†</sup> (0.38)	-0.59 (0.41)	-0.48 (0.46)	-0.49 (0.35)	-0.44 (0.28)	-0.66 <sup>†</sup> (0.40)	0.09 (0.35)
Nursing home (standard error)	-0.91 (0.63)	-0.19 (0.57)	0.10 (0.60)	0.02 (0.60)	-0.03 (0.50)	0.13 (0.43)	-0.20 (0.59)	0.59 (0.49)
Stakeholder pressure (bootstrap standard error)		0.45*** (0.09)	0.46*** (0.09)	0.47*** (0.09)	0.44*** (0.08)	0.47*** (0.07)	0.45*** (0.09)	0.51*** (0.08)
Lack of resources (bootstrap standard error)			-0.05 (0.11)	-0.06 (0.12)				
Lack of resources × stakeholder pressure (bootstrap standard error)				-0.03 (0.08)				
Lack of commitment (bootstrap standard error)					-0.21* (0.11)	-0.21* (0.09)		
Lack of commitment × stakeholder pressure (bootstrap standard error)						-0.17* (0.07)		
Difficulty in evaluating impacts (bootstrap standard error)							0.01 (0.09)	-0.10 (0.09)
Difficulty in evaluating impacts × stakeholder pressure (bootstrap standard error)								-0.19** (0.07)
Constant (bootstrap standard error)	3.33** (1.01)	1.78* (0.73)	1.97* (0.79)	1.97* (0.83)	2.50*** (0.68)	2.73*** (0.63)	1.75* (0.77)	2.07*** (0.72)
Adjusted R <sup>2</sup>	0.13	0.47	0.46	0.45	0.53	0.58	0.46	0.54

N = 63

Significant at the: <sup>†</sup> 0.10, \* 0.05, \*\* 0.01, and \*\*\* 0.001 levels

On the one hand, Murillo-Luna et al. (2011) did not find that limited employee motivation and preparation with respect to environmental issues represented significant barriers in their sample of industrial firms.

Organisational lack of commitment to environmental issues may be more prominent in the healthcare setting than in industrial firms because of the specific nature of the former. Healthcare organisations are acknowledged as extremely complex professional realities (Bate 2000; Davies et al. 2000; Glouberman and Mintzberg 2001), in which physicians are key decision makers in both the clinical and administrative domains (Battilana 2011). Indeed, healthcare managers can rely less on top-down strategies to ignite change, and, thus, gaining support from other professional groups—especially from physicians—becomes essential for implementing and institutionalising new programmes and activities (Ferlie et al. 2005; Best et al. 2012).

On the other hand, Murillo-Luna et al. (2011) found that budgetary constraints had a significant negative direct influence on environmental proactivity in industrial organisations.

Coherent with this evidence, the healthcare managers in our sample recognised the lack of resources as an important barrier to implementing PESs—as suggested by the mean value of the factor named “lack of resources” (mean = 5.49). However, this internal barrier did not discriminate between the most and the least proactive healthcare organisations in our sample, but rather represented a common condition that all managers need to overcome—as suggested by the SD of the factor named “lack of resources” (SD = 1.05). This argument relies on the fact that during the last decade healthcare managers have been required—in Italy as well as in other countries—to innovate and change without dedicated, incremental financial resources (de Belvis et al. 2012; McKee et al. 2012), because of the need to contain healthcare expenditures (Quaglio et al. 2013; Bosch et al. 2014). In this view, while all healthcare organisations in the sample faced a similar lack of resources, only some of them were actually able to overcome this constrain. It may be the case that the resources needed to adopt green technologies, and implement environmental management practices were attracted by the most proactive organisations from external sources, such as donors, sponsors, contractors or suppliers (Thompson and McKee 2004; Rye and Kimberly 2007) and, thus, the difference between the most and the least proactive organisations may depend on the capability of leveraging on external sources of funding rather than on the availability of resources within the organisation.

Finally, we show that the effect of stakeholders’ requirements in the environmental domain is lowered in healthcare organisations that (i) consider it difficult to assess the changes that environmental protection requires

and to evaluate their benefits, costs and impacts on performance, and (ii) are characterised by a lack of commitment to environmental practices among employees. Our results extend previous research that looked at the relationship between stakeholder pressure and PESs and between internal barriers and PESs independently, showing two organisational factors that function as contingencies of stakeholder pressure and modify the extent to which stakeholders’ demands are transformed into organisational decisions and actions for advanced environmental protection. In doing so, we respond to the call advanced by de Lange et al. (2012) and Menguc et al. (2010) for more cross-cutting research to understand sustainability-related phenomena. In addition, we advance current knowledge on the reasons organisations respond differently when facing the same levels of stakeholder pressure on environmental matters, as observed by Delmas and Toffel (2011).

### Contributions to Practice

Our study also has practical and policy-related implications. First, we provide healthcare managers and stakeholders with indications on the main barrier that should be removed to foster the adoption of PESs in healthcare organisations, namely, the lack of employee commitment to environmental issues at all levels. In this regard, effective communication plays a central role in shaping the understanding of environmental problems, influencing support for endorsing environmental policies, practices and behaviours and bringing about changes in norms and values around environmental protection (Moser 2010; Moser and Dilling 2011). Because previous research on communicating environmental problems has highlighted the importance of framing environmental issues according to the background of the targeted audience and addressing their personal information needs (Nisbet 2009), managers and stakeholders of healthcare organisations could valuably increase the understanding of environmental problems and diffuse the knowledge to tackle them among professionals (doctors, nurses, administrative staff, etc.) by means of awareness campaigns and training programmes that highlight how the environment and human health interact and are dependent on each other, in addition to the opportunities, responsibilities and actions that professionals—individually and as groups—need to take in order not to harm the environment. Awareness and education might also be strengthened by the provision of incentives in a variety of forms, such as monetary rewards, performance bonuses (Merriman and Sen 2012), recognition and praise (Govindarajulu and Daily 2004), which past research proved to be effective in directing both managers’ and employees’ efforts towards the environment (Merriman and Sen 2012; Renwick et al. 2013). Therefore, managers and stakeholders could effectively use

monetary and non-monetary incentives to obtain buy-in and commitment to the achievement of environmental goals (RAND Corporation 2012).

Finally, professionals' motivation might be increased by leveraging on ethical principles that combine an effective, efficient and safe delivery of care with a reduced impact on the environment. In this regard, Jamerton and McGuire (2002) invited to overcome the tension between medical and environmental ethics by discussing the "ecosystem dependency" (i.e., human health depends on the health of the ecosystem); by promoting "ecological prevention over treatment" (i.e., public health and prevention should prevent the use of natural resources for acute care and treatments); and by "including environmental costs" in the appraisal of models of care, therapies and technologies.

Second, our research shows that stakeholders could contribute to lowering the indirect effects of internal barriers—and thus facilitate the adoption of PESs—by supporting the creation of compelling "business cases" for environmental protection. Indeed, stakeholders could provide access to measures and tools to assess, prioritise, implement and evaluate interventions, actions and investments to reduce environmental impacts while improving efficiency and saving money. Moreover, the provision of mechanisms to exchange case studies and best practices would be valuable for showing the costs and the tangible and/or intangible benefits that working proactively on environmental issues could produce, such as reducing cost and risk, developing reputation and legitimacy, attracting talent and achieving win-win outcomes between environmental sustainability and quality of care.

#### Limitations and Directions for Future Research

The above findings should be interpreted in light of the limitations of this study, which we suggest addressing in future research.

First, our sample size was relatively small, and thus future empirical studies based on larger samples would be valuable for increasing the results' robustness and reliability.

Second, because we focused on Italian healthcare organisations, additional analyses involving other countries would be necessary to strengthen the generalisability of our findings.

Third, because our questionnaire was completed by a single respondent, CMV might be a concern. Although we implemented a number of strategies to mitigate the single-source bias, and the Harman's test behaved well, future research relying on multiple sources of information would be valuable.

Fourth, this study investigated the relationship between the intensity of stakeholder pressure and the development of PESs, regardless to specific stakeholders' needs.

Therefore, it might be valuable to investigate the relationship between the adoption of specific practices (e.g., EMAS vs. ISO14001 certification) or technologies (e.g., solar panels, water-saving solutions) and the influence exerted by specific groups of stakeholders.

Finally, we adopted a cross-sectional design in the data gathering, and, therefore, no definitive answer on causation can be claimed. Future longitudinal studies would be useful for clearly establishing causality and they would also be helpful for investigating whether, how and why the role of internal barriers could change.

#### Conclusion

The societies of the most developed countries have been raising concerns about healthcare's use of precious, non-renewable resources and the impact of that use on local communities in terms of pollution and on the global population in terms of contributing to climate change.

However, healthcare organisations still represent "cautious adopters" of PESs (The Boston Consulting Group and MIT Sloan Management Review 2011; Lynch 2011).

Our study highlights that, even though stakeholder pressure is a significant trigger for PESs, the lack of employee commitment and the difficulty in evaluating impacts represent the major roadblocks needed to be overcome by healthcare organisations for adopting PESs. The findings of our study—which is to our best knowledge one of the first to address environmental issues in healthcare—set the stage for future research aimed at shedding more light on healthcare organisations' journey towards the capability of "improving our health today in ways that do not disproportionately harm the health of others elsewhere or in future" (Pencheon 2013, p. 194).

#### Appendix

##### Proactive Environmental Strategy

Please indicate, on a scale ranging from (1) "strongly disagree" to (7) "strongly agree", to what extent you agree with each of the following statement.

- (a) Environmental goals are clearly defined in my organisation,
- (b) My organisation adopts technologies that prevent pollution and minimize environmental impact,
- (c) Employees are trained in environmental issues in my organisation,
- (d) In my organisation, responsibilities on environmental matters are clearly defined and assigned,

- (e) My organisation periodically reports its environmental performance to its stakeholders,
- (f) My organisation requires its suppliers to hold an environmental certification (e.g., EMAS, ISO14001),
- (g) In my organisation, a significant part of improvement expenses are dedicated to environmental-oriented projects.

#### Stakeholder Pressure

Please indicate, on a scale ranging from (1) “extremely low” to (7) “extremely high”, the degree of pressure each of the following stakeholder exert on your organisation to address environmental issues.

- (a) Local institutions,
- (b) Regional institutions,
- (c) National institutions,
- (d) Employees,
- (e) Professional associations,
- (f) Patients,
- (g) Patients’ associations,
- (h) Other healthcare organisations,
- (i) Local community,
- (j) Suppliers,
- (k) The media.

#### Internal Barriers

Please indicate, on a scale ranging from (1) “not at all important” to (7) “extremely important”, how important each of the following barrier is in hindering the implementation of environmental programmes and initiatives in your organisation.

- (a) Limited financial capability for environmental investments,
- (b) Lack of human resources to dedicate to environmental activities,
- (c) High cost of environmental services and technologies,
- (d) Difficulty in protecting the environment without increasing costs,
- (e) Limited knowledge of environmental problems among employees,
- (f) Limited knowledge of environmental problems among directors,
- (g) Limited interest in environmental issues among employees,
- (h) Limited interest in environmental issues among directors,
- (i) Unfavourable attitude of the employees due to other priorities,

- (j) Unfavourable attitude of the directors due to other priorities,
- (k) Difficulties in evaluating the financial benefits of environmental investments,
- (l) Difficulties in evaluating environmental activities’ impacts on non clinical processes,
- (m) Difficulties in evaluating environmental activities’ impacts on clinical pathways,
- (n) Difficulties in evaluating intangible impacts of environmental activities (e.g., reputation in the community, image as a great place to work).

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