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Application of Theory of Planned Behavior to investigate the role of Employee Green Intention to Achieve Ecological Sustainable Behavior: An overview of Pharmaceutical Industry of Pakistan

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Abstract
This study provides an opportunity for the pharmaceutical industrial sector of Pakistan to become driver of positive change by motivating employees to adopt green sustainable and ecological sustainable behavior at their work place. Data was collected using questionnaire and 100 responses of pharmaceutical employees were analyzed using structure equation modeling statistical technique. The results showed that green attitude, green subjective norms, green perceived behavioral control draw significant impact on employee environmental friendly by proving all the hypothesis positive. The study provides the understanding to pharmaceutical practitioners that practical implementation of green friendly environmental strategies would lead pharmaceutical firms to gain lower cost benefits, reduction of energy consumption, reduces the emissions and exposure to chemical substances. This all ultimately enhance and build the goodwill and reputation of firm in the eyes of its stakeholders.

Keywords: Theory Of Planned Behavior, Green Attitude, Green Training, Green Perceived Control, Green Intention, Ecological Sustainable Behavior

INTRODUCTION

The inclination of adopting eco-friendly sustainable environmental strategies and being green has gained considerable contemplation from both scholars and industry practitioners over the past few decades but it now it has become crucial element of the strategic vision of the organizations.

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Many researchers have explored various dimensions of green business functional operations within the context of organization for instance green purchasing (Zhang, Li, Cao & Huang, 2018), green supply chain management chain (Kazancoglu, Kazancoglu, & Sanak, 2018; Zaid, Jaaron, & Bon, 2018), green innovation (Li, Zhao, Zhang, Chen, & Cao, 2018), green finance (Ng,2018), green human resource management practices (Mustapha, Abdul Manan, & Wan Alwi, 2018), green information technologies (Przychodzen, Gomez-Bezares, & Przychodzen, 2018), and green human resource management (HRM) (Renwick, Redman, & Maguire, 2013; Zaid et al., 2018).

Due to growing global environmental shift towards achievement of sustainable future, there is an increasing intensive pressure on the pharmaceutical industry to be environmentally accountable and to join the environmental sustainable movement. Currently, pharmaceutical sector has to face challenges in order to ensure that there are less environmental issues leading due to the operations of pharmaceutical operations such as fossil fuel consumptions, carbon footprints, exposure of chemical substances, cost incurred in disposal of waste material and generation of a lot of carbon dioxide from pharmaceutical plants. Recent research continues to emphasize the importance of understanding the psychological and organizational factors that shape employees' environmentally sustainable behavior.

In a systematic review, Frosini et al. (2026) examined applications of the Theory of Planned Behavior (TPB) to employee green behavior and highlighted the relevance of attitudes, subjective norms, and perceived behavioral control in explaining employees' green intentions and behavior. The authors also identified methodological limitations in existing research, including the widespread use of cross-sectional, self-reported data and the need for stronger theoretical justification of proposed relationships. Complementing this theoretical perspective, Mostafa (2025) investigated green human resource management practices in Egypt's pharmaceutical industry and found that green recruitment and green training were particularly influential practices, while psychological green climate mediated the relationship between green HRM practices and employee green behavior.

These findings suggest that employees' environmental behavior should be understood in relation to both individual psychological determinants and the organizational environment. Accordingly, examining green attitudes, subjective norms, perceived behavioral control, and employee green intentions remains relevant to understanding ecological sustainable behavior in Pakistan's pharmaceutical industry.

However, many organizations have taken several initiatives to reduce consumption of energy (Davis and Challeger, 2009). Many firms across world have reshaped their business strategies to meet the increasing expectations of consumers towards environmental concern (Lee, 2008; Miniero et al., 2014).

Review of Pharmaceutical Sector of Pakistan

During last three decades, Pakistan pharmaceutical sector has demonstrated substantial growth and contribution towards national economy. Pakistan is counted among those least developing countries where local pharmaceutical sector is growing

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at a significant fastest rate (Aamir and Zaman, 2011; Policy Research Institute of Market Economy, 2017). In 1990s, Multinational companies had occupied clear dominancy in obtaining market shares of the country , but according to the current estimated ratio, local Pakistani companies are ruling by feeding the 70% to 80% demand and supply requirements of the country (Atif et al., 2017; Policy Research Institute of Market Economy, 2017). Approximately, pharmaceutical local sector has reported annual US$200 million contribution in Pakistan (Faryal, Naveed R. Khan, Aqeel, Akbar, 2019).

LITERATURE REVIEW

This research paper presents comprehensive research framework on the application of the theory of planned behavior (Ajzen, 1985) to explore intentions to adopt green attitude and ecological sustainable behavior in a pharmaceutical workplace setting. Employee behavior is also considered an important tool in bringing environmental improvements (Oskamp, 1995, 2000a, 2000b). There are number of research studies who used theory of planned behavior and contributed significant addition in literature in various domains (e.g. Sparks 1994; Blue, 1995; Conner & Sparks, 1996; Godin, 1993; Jonas & Doll, 1996; Manstead & Parker, 1995; Ajzen, 1991; Godin & Kok, 1996; Hausenblas, Carron, & Mack, 1997; Van den Putte, 1991;Knussen &Yule, 2008; Trumbo & O Keefe, 2001). According to Ajzen (1994), theory has an influential power of to predict human behavior, personality traits and psychological domain. Ajzen (1991) extended the model of theory of reasoned action by adding the variable of perceived behavioral control in the theory of planned to measure non-volitional factors which are beyond the control of individuals. Whereas, theory of reasoned action measures behavior which are quite straight forward and comes under volitional factors. The term attitude refers to the behavior of individuals or degree to which a person shows favorable or unfavorable behavior (Ajzen, 1991). Attitude can also be referred to as an individual's judgment whether good or bad towards the particular behavior (Leonard et al 2004). Moreover, Ramayah et al (2010); stated that attitude leads to do the behavior and consequences of behavior. Kotchen and Reiling (2000) considered attitude as a valuable predictor of behavioral intention. Attitude is the psychological emotions reflect through the behavior (Chen and Tung, 2014). Normative beliefs refers to social pressure (may be in the form of norms, beliefs, perception, opinion etc) that others expect to behave in a certain manner but coupled with one's willingness to comply with these subjective norms. Ajzen (1985) stressed that perceived behavioral control is the strong predictor of theory of planned behavior. He added Perceived behavioral control to increase the predictive power of the theory. Ajzen (1991) argued that existence of other non-volitional factors that may increase ease or difficulty in performing the behavior. The TPB model developed by the Ajzen (1985) indicates various determinants of intention (attitude, subjective norms and PBC) are explained as the sub constructs of behavioral belief, normative belief and control belief respectively. This research study is grounded by using main construct of TPB (attitude, subjective norms and PBC) to predict the behavior of employees engaged in the pharmaceutical sector of Pakistan.

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Conceptual Framework

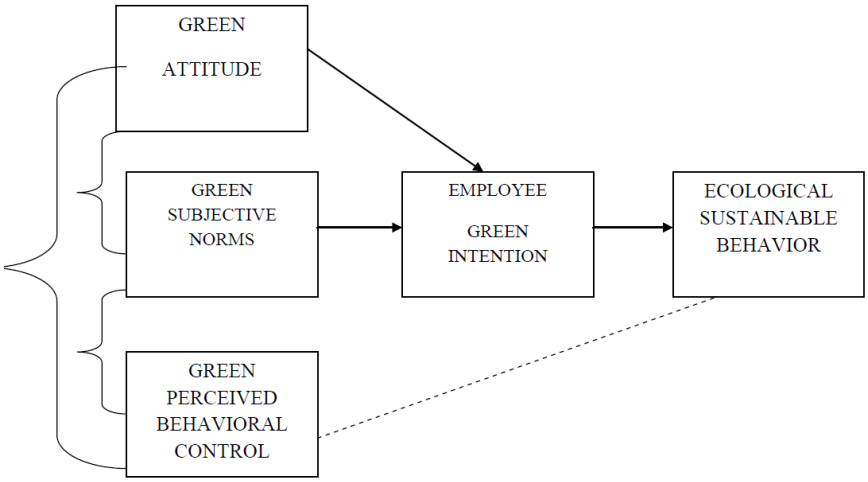


Figure 1: The Research Model

Research Hypotheses

Green attitude

Green attitude refers to the adoption of pro-environmental behavior or positive beliefs regarding engagement of environmental friendly attitude. Various research studies have shown the results that green attitude and employee green intentions have positive relationships (Mostafa, 2007;). According to Birgelen et al (2015); consumers prefers to buy those companies which are found responsible for performing pro-environmental behavior. Many studies which were conducted to throw light in the context of green hotel have found that green attitude intentions have strong positive influence on green intentions (Han and Yoon, 2015; Teng et al, 2014; Chen and Tung, 2014; Chen and Peng, 2012; Han et al., 2011; Han and Kim, 2010; Han et al., 2010) and same attitude and intentions were also found positively correlated in the case of organic food choice behavior which determines attitude-intention relationship in green consumption settings. Thus, study successfully developed the following hypothesis.

H_1: Green attitude significantly impact on employee green intention.

Green Subjective Norms

Green subjective norms pressure to adopt or engage environmental activities due to opinions of other people. The term subjective norms refers to the influence of social pressure may be in the form of value, expectations, policies, procedures, pre-defined values (Ajzen, 1991; Han 2010; Hee, 2000). Hee (2000) identified social norms as the influential pressure on individuals which is generated from various friends, colleagues, relatives, business partners to get in the desired behavior adoption. Many more research studies have explored the positive effect of subjective norms in the creation behavioral intentions to engage in the desired behavior. Studies like technology use

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intention (Baker, 2007); organic food purchase intention (Dean, 2012); green hotel visit intention (Teng 2014; Chen and Tung 2014) have found that there is a close relationship of subjective norms and behavioral intention adoption. Therefore, the study leads to establish following hypothesis.

H_2: Green subjective norms significantly impact on employee green intention.

Green perceived Behavioral Control

Perceived Behavioral Control means difficulty or ease in performing the desired behavior (Ajzen, 1991). The term green PBC reflects to find difficulty or ease in adopting environmental friendly behavior or practices or facilitating factors (Ajzen 1989; Sarver, 1983); Self-efficacy (Bandura, 1992). Several studies have diagnosed the strong positive relationship PBC to predict intentions. For instance organic food purchase intention (Dean, 2012); green hotel visit intention (Teng 2014; Chen and Tung 2014). Hence, PBC predicts to intentions.

H_3: Green perceived behavioral control significantly impact on employee green intention.

Ecological sustainable behavior

Ecological sustainable behavior refers to the adoption of environmental friendly activities or practices without compromising the ability of future generations to meet their demands (Howard, 2011), which results in fruitful development of economic and social blossom (Chernev and Blair 2015; Savitz and weber 2013); reduction of energy consumption and usage of water (Lin and Chang et al 2012). Organizational green practices refer to hiring of those employees which can maintain and develop eco-friendly sustainable attitude (Guest, 1997; Bohdanowicz et al., 2011; Jabbour and Santos, 2008; Paillé et al., 2014). Greaves et al (2013) investigated intentions of employees in switching off computers and lights while leaving their offices after official hours for home, use of video conferencing rather than traveling physically and recycling of waste material behaviors of employees at their workplace. Likely, Block et al (2015) also organized a survey study to diagnose the intention of university employees who are engaged in performing green behavior and focusing on the adoption of ecological sustainable behavior. Thus, it has been proved that employee green intentions significantly impact on the adoption of ecological sustainable behavior, which leads to explore following hypothesis.

H_4: Employee green intention significantly impact on ecological sustainable behavior.

Green perceived behavioral control and Ecological Sustainable Behavior

The model discussed by Ajzen (1985, 1989, 1991) have discussed that although PBC is the strong predictor of intention but it also generate slight impact in determining behavior. So, the following hypothesis can be established.

H_5: Green perceived behavioral control significantly impact on ecological sustainable behavior.

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METHODOLOGY

Data collection and sample

The research study deals with complexities of quantitative data analysis procedure. Primary data for this research study was gathered through using self-administered survey. Pharmaceutical sector functioning in Pakistan was considered as social lab for this research. Purposive sampling technique was adopted. Total 130 questionnaires were circulated in respondents who belonged to Pakistan pharmaceutical sector with 100 returned responses (shows approximately 77% response rate). Across 18 pharmaceutical companies were involved to collect primary research data.

Measurement Scales

This research study measurement scales were proved to be validated already in previous research literature. Variable green attitude was measured by using 3-items, 5-point likert scale was adopted from Taylor & Todd (2006); Chan (2001); Mostofa (2006). To measure Green subjective norms 4-item, 5-point likert scale was used from Jabbar (2011); Yong & Yusliza (2016). Scale of green perceived behavioral control was measured by using 10-items, 4-point likert scale taken from Ajzen & Fishbein, 2005. The validated measurement scales of green behavioral intention 3-item,7-point likert type scale was used to measure green employee intention obtained from Ajzen & Fishbein, 2005. Moreover, a 6-item, 7-point likert scale was used to measure ecological-sustainable behavior which was adopted from Chou (2014); Hsiao et al. (2014); Scherbaum et al. (2008); and Tudor et al. (2007).

Results

Adanco software (version 2.1) was used to test the examination of conceptual framework. Two-step approach criteria explained by Anderson and Gerbing (1988), Firstly, a model measurement was tested using construct reliability, convergent and discriminant validity. Secondly, hypotheses testing were done using structure equation modeling.

Constructs Name	Cronbach Alpha(α)	Convergent Validity
Green Attitude	0.8207	0.7327
Green Subjective Norms	0.8071	0.6195
Green PBC	0.7199	0.3700
Green Intention	0.7773	.6901
Ecological SB	0.7606	0.4620

Table 1: Results of Constructs reliability and Convergent validity

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As shown in above table 1, internal reliability of the constructs were measured using cronbach alpha. Result shows that the values of cronbach alpha lie between (0.7199 – 0.8207) and are higher than .70 (Nunnally & Berstein, 1994), shows satisfactory results of internal reliability of the constructs. Results of the convergent validity (Average variance extracted) shows values between range of (0.3700 – 0.7327). According to Fornell & Larcker, (1981), each construct should have exceeded value of .50, but .45 is also acceptable. However, in our case green PBC (0.3700).

Constructs	1	2	3	4	5
Green Attitude	0.7327				
Green Subjective Norms	0.1996	0.6195			
Green PBC	0.2680	0.3696	0.3700		
Green Intention	0.1292	0.1108	0.1598	0.6901	
Ecological SB	0.1390	0.1454	0.2733	0.4155	0.4620

Table 2: Results of Discrimininant Analysis

To confirm discriminant Fornell & Larcker, (1981) stated that value of each construct should be greater than any pair of squared correlation. In this research study this condition satisfies successfully.

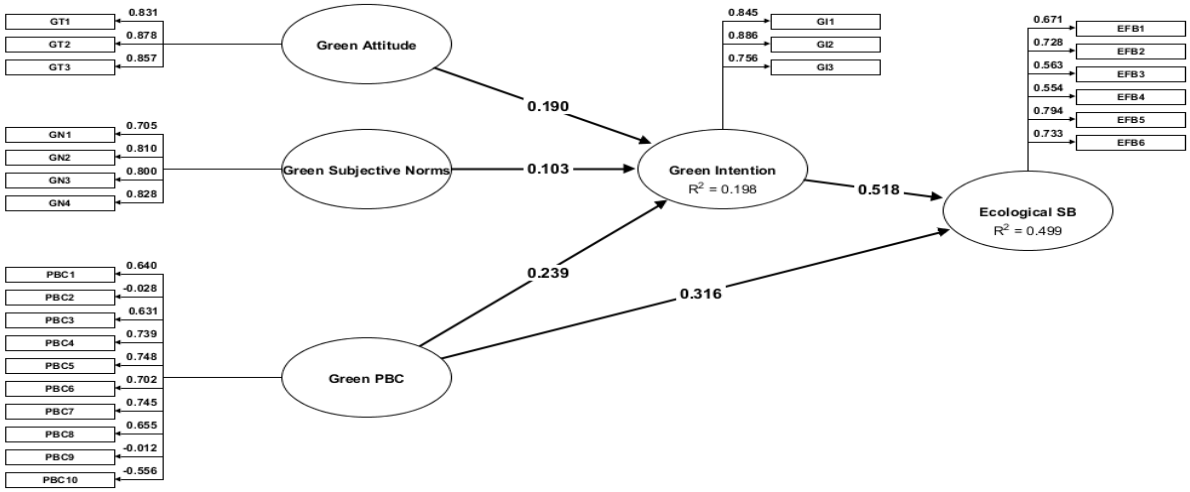


Figure 2: Results of Adanco Analysis

The research model was further tested through structure equation modeling (SEM). Figure 2 depicts results of the structure equation modeling analysis. All the hypothesized paths H1 H2 H3 H4 H5 have significant coefficient values. All path

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coefficient value are >.05 which shows acceptance. Path coefficient predicts green intention and ecological sustainable behavior provides $r^{2=}$ 0.518. This is usually considered good while predicting human behavior as previous finding reported low path coefficients between intention and behavior.

Conclusion

The findings of this study shows that green attitude, green subjective norm, green perceived behavioral control draw influence in predicting employee intention in adoption of ecological sustainable behavior. Supporting of all hypothesis shows that pharmaceutical companies should take considerable initiatives and parameters to familiar their employee with adoption of green and ecological sustainable behavior. Results of the study throw light that all the construct of theory of planned behavior may answer the managerial problems of pharmaceutical waste management. This research study provides base for pharmaceutical companies to give proper training to their employee to develop green environmental attitude and formulate strategies and policies to promote ecological sustainable behavior in employees. The overall conclusion emerges that the right marketing strategy for any Pharmaceutical company would be to build on proven a focus on changing customer behavior.

Theoretical Contributions

This study is amongst very few studies which have tested model of theory of planned behavior with the incorporation of intention and behavior as most of the studies limited their testing of hypothesis till intention. However, the theoretical contribution of this research study is to predict good path coefficient r^2=0.518 while in the prediction of employee green intention and employee ecological sustainable behavior. In other studies, as reported by other researcher (Ajzen 2011, Bandurah 1999) have raised the problem of low coefficient results of this path. But, this study provides good and much satisfactory results while predicting intention and behavior by focusing on particular social lab of employee related to pharmaceutical industry.

Practical Implication

For practitioners of pharmaceutical industry, the study reveals significance of adopting green and environmental friendly attitude, organizational perceived green norms and values, employee favorable response to adopt environmental friendly practices. Because ecological sustainable behavior is considered primary concern to gain stakeholders confidence and to ensure industry sticks within the context of global hyper competition by minimizing the negative effect of operations of pharma plants on environment. It is useful to gain insights knowledge and in depth analysis regarding characteristics of social lab related to pharma currently working in it. As this is based on the measurement of the characteristics of consistent and specific social lab Moreover, study provides the understanding to pharmaceutical practitioners that practical implementation of green friendly environmental strategies would lead pharmaceutical firms to gain lower cost benefits, reduction of energy consumption, reduces the emissions and exposure to chemical substances. This all ultimately

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enhance and build the goodwill and reputation of firm in the eyes of its stakeholders. Last but not least, concept of green promotes application of best standards of health, safeguards and ensures employee safety.

Limitations and Future research

There are limitations in this research study which have limited the span of its scope. Firstly, the results of this study is based on the measurement of the characteristics of consistent and specific social lab, this limits the generalizability scope of the study. Secondly, this research study used a cross-sectional study approach. But, it is believed that longitudinal studies provide more accurate and authentic results in the context of temporal causality (Ajzen, 1991). This study is intended to provide some future strategies and recommendations for Pharmaceutical industry. Future research dimensions can examine various factors. This study has developed conceptual framework on standard model of theory of planned behavior. For future research various other variables can be added for extension and examination of new paths can be examined. In this study, pharmaceutical sector is taken as unit of analysis. Future research can be carried by considering multiple industrial sectors in to an account. Dimensions of the future study may be continued to examine by incorporating other demographics, cross-cultural comparisons by taking new geographical segmentations to conduct study.

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Annexure 1: Study constructs with measurement items

Green Attitude (5-point Likert scale)

1) I like the idea of purchasing green.
2) Purchasing green is a good idea.
3) I have a favorable attitude purchasing green version of a product

Perceived Behavioral Control (Responses on a 4-point Likert scale)

1) I find it easy to be friendly with the environment.
2) I find it difficult to preserve resources and recycle.
3) I am confident that I can protect the environment.
4) I can control my involvement in environmental preservation initiatives.
5) I am fully capable of protecting the environment.
6) I always find a way to be friendly with the environment.
7) I am in full control of my actions to protect the environment.
8) I am good at leading a green lifestyle.
9) It is not easy for me to stick to my sustainability goals and preserve the environment.
10) Being friendly with the environment is out of my hands.

Green Behavioral Intention (7-point Likert scale)

1) I will try to reduce my carbon footprint in the forthcoming month.
2) I intend to engage in environmentally friendly behavior in the forthcoming month.
3) I plan to stop wasting natural resources in the forthcoming month.

Subjective Norms (5-point Likert scale)

1) Most people who are important to me think I should purchase green products when going for purchasing.
2) Most people who are important to me would want me to purchase green products when going for purchasing.
3) People whose opinions I value would prefer that I purchase green products.
4) My friend's positive opinion influences me to purchase green product.

Employees' eco-friendly behavior (7-point Likert scale)

1) Before I get off work, I turn off the electric appliances, such as computers, TV monitor etc.
2) When I leave a room that is unoccupied, I turn off the light.
3) I sort and recycle garbage in the workplace.
4) I conserve materials at work.
5) I limit water use in toilet to save water.
6) I pay close attention to water leak