

Article

Intentions to Create Green Start-Ups for Collection of Unwanted Drugs: An Empirical Study

Anuli Njoku ^{1,*}, Kamel Mouloudj ², Ahmed Chemseddine Bouarar ², Marian A. Evans ¹,
Dachel Martínez Asanza ³, Smail Mouloudj ² and Achouak Bouarar ⁴

¹ Department of Public Health, College of Health and Human Services, Southern Connecticut State University, New Haven, CT 06515, USA; evansm7@southernct.edu

² Department of Commercial Sciences, College of Economic, University Yahia Fares of Medea, Medea 26000, Algeria; kmouloudj@yahoo.fr (K.M.); shemseddine26000@gmail.com (A.C.B.); mouloudj.smail@yahoo.com (S.M.)

³ Department of Scientific-Technical Results Management, National School of Public Health (ENSAP), Havana Medical Sciences University, Havana 10800, Cuba; dachelmtnez@infomed.sld.cu

⁴ Department of Medicine, College of Medical, University Saad Dahleb Blida 1, Blida 09000, Algeria; achouakbr122@gmail.com

* Correspondence: njokua3@southernct.edu

Abstract: Drug waste poses a real threat to human health and the environment. Therefore, recycling and sustainability scholars have recently sought practical solutions to the drug waste problem. Furthermore, several governments have made significant efforts to reduce the negative effects of waste, such as establishing programs to take back unwanted drugs (expired and unused) for recycling (i.e., drug reuse or drug redispersing). However, many of these programs have failed to achieve their goals. In this context, it is expected that creating green start-ups to collect unwanted drugs will contribute to solving this problem. Accordingly, this study aims to investigate the antecedents of intentions to create green start-ups for collecting unwanted drugs. To this end, the authors integrate start-up self-efficacy and drug waste collection-related knowledge constructs into the theory of planned behavior (TPB). Using a self-administered paper questionnaire and relying on a convenience sample, data were collected from 328 students in six Algerian universities. A hierarchical multiple regression was conducted to test the proposed study model. The results revealed that perceived behavioral control (PBC) ($\beta = 0.187, p < 0.001$), attitudes ($\beta = 0.182, p = 0.002$), start-up self-efficacy ($\beta = 0.169, p = 0.001$), drug waste collection-related knowledge ($\beta = 0.161, p < 0.001$), and subjective norms ($\beta = 0.088, p < 0.05$) have a positive significant effect on the intention to create a start-up to collect unwanted drugs. In conclusion, this paper contributes to reducing drug waste by investigating the drivers of intention to create green start-ups for collecting unwanted drugs. Therefore, our study is expected to provide valuable insights for hospitals, pharmacies, pharmaceutical manufacturers, environmental protection associations, and stakeholders interested in reverse logistics.

Keywords: green entrepreneurship; pharmaceutical waste; unused drugs; expired drugs; waste management knowledge; circular economy; recycling; sustainability; theory of planned behavior; medication disposal



Citation: Njoku, A.; Mouloudj, K.; Bouarar, A.C.; Evans, M.A.; Asanza, D.M.; Mouloudj, S.; Bouarar, A. Intentions to Create Green Start-Ups for Collection of Unwanted Drugs: An Empirical Study. *Sustainability* **2024**, *16*, 2797. <https://doi.org/10.3390/su16072797>

Academic Editors: Xuan Cuong Nguyen, Sunil Herat, Kieu Lan Phuong Nguyen and Elena Cristina Rada

Received: 1 February 2024

Revised: 21 March 2024

Accepted: 25 March 2024

Published: 27 March 2024



Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Drug waste can be defined as “drugs that can no longer be used because of being expired, unused, spilled, withdrawn, recalled, damaged, contaminated, or for any other reason” [1] (p. 2). This waste is often generated as a result of prescribing excessive drugs and/or not consuming all of the prescribed quantity, as some people resort to storing them correctly (or incorrectly) in their homes indefinitely [2–5]. Furthermore, many households do not know (are unaware) how to properly deal with unwanted drugs. In fact, when households decide to get rid of unwanted drugs, they throw them in the toilet, sink, drain, or household

garbage [5–7]. For this reason, Kaewchutima et al. [8] argued that proper waste disposal practice-related knowledge should be intensively promoted. Therefore, there is no doubt that unwanted drugs have many serious impacts (such as contamination and toxicity) on public health and the environment (e.g., animals, water, and plants) [2,4,9–11], as well as on the economy. In this regard, waste drugs can be classified in several ways. For example, waste drugs can be classified on the basis of environmental and public health risks into (1) high-risk or hazardous waste drugs (e.g., chemotherapy drugs) and (2) low-risk or non-hazardous waste drugs, (e.g., antibiotics drugs). In economic terms, we can also classify them into (1) high-cost (e.g., cancer drugs and orphan drugs), (2) medium-cost, and (3) low-cost waste drugs (e.g., pain-relief drugs). Hence, improper management of drug waste squanders opportunities to recover valuable resources, creates an ecological imbalance, and threatens sustainability.

For this reason, several countries in recent years “have been concerned about how to dispose of unused pharmaceuticals that can endanger human health and the environment” [12] (p. 1). Hence, many countries, including developing countries, have practically begun to encourage behaviors to reduce drug waste [5]. However, most African countries, including Algeria, Nigeria, and Ethiopia, still lack effective programs for the disposal of unwanted drugs [3,5,7,13]. In contrast, some countries have also established unwanted drug take-back and disposal programs [2]. Unfortunately, most of these programs have failed due to the low level of awareness about the negative consequences and lack of drug waste risk perception [5,14], and sometimes due to lack of knowledge about such programs at all. For example in Liberia, Toe et al. [6] reported that only about 3% of respondents were aware of drug take-back systems. In this context, Woldeyohanins et al. [7] (p. 1) stated that “guidelines on safe disposal are required, and an organized method of collecting unused and expired pharmaceuticals needs to be introduced”. For their part, Kahssay et al. [3] argued that reducing the negative effects of unwanted drugs requires creating drug take-back programs. In addition, Abahussain et al. [15] (p. 198) pointed out that “the proper collection and disposal of unwanted medications through a well-run disposal system and collection programs are paramount in ensuring the safety of humans and the natural environment”. Kusturica et al. [16] also pointed out that the “proper collection and disposal” of unwanted drugs from households would minimize the harmful effects of drug waste on the environment.

Desai et al. [10] (p. 1) stated that “efforts to curb pharmaceutical pollution in the European Union (EU), United States (US), and Canada have emerged along with waste disposal and treatment procedures”. In fact, both developed and developing countries suffer from the problem of drug waste. For example, reports indicate that nearly two-thirds (2/3) of prescription drugs are unused in the US [1]. In China, 64.1% of survey respondents stated that they dispose of unwanted pharmaceutical products via the trash [11]. In Kuwait, Abahussain et al. [15] indicated that 73% of pharmacists participating in the survey dispose of unwanted drugs through the trash. In India, Hajj et al. [2] mentioned that 39% of respondents had proper knowledge about the disposal of unwanted drugs, while in Lebanon the percentage was only 24.5%. In Serbia, Kusturica et al. [16] found that 59.1% of respondents disposed of unused drugs in the garbage, and also concluded that improper disposal of unused drugs is widespread among the Serbian population. In contrast, a study in Finland reported that “people are familiar with the correct disposal of medicines” [9] (p. 1). Nevertheless, developing countries are more vulnerable to drug waste risks than developed countries [1] for several reasons, including lack of public awareness, poor or/absent waste management strategies, inappropriate disposal systems, and insufficient resources. Furthermore, although returning unwanted drugs to pharmacies is a responsible behavior to reduce drug waste [5], Chong et al. [17] stated that some pharmacists in Malaysia may not be willing to engage in this service because they consider it costly and an additional burden on pharmacy employees that requires financial incentives from the government. Therefore, we believe that one of the effective solutions to the drug waste problem is to encourage the establishment of green start-ups to collect unwanted drugs. Green start-ups focus on achieving the three dimensions of value, “i.e., economic,

environmental, and social value”, and this is what makes them different from business start-ups [18]. In the last five years in Algeria, the Ministry of Higher Education and Scientific Research (MHESR) has taken the initiative to establish business incubators in almost all Algerian universities with the aim of transforming student and researcher projects into start-ups. In 2020, the government also established a ministry charged with supporting and encouraging the creation of start-up companies, which is the Ministry of Knowledge Economy, Startups and Micro Enterprises (MKESME).

In Algeria, as in other African countries, there is a paucity of studies focusing on finding practical solutions to the problem of drug waste [5]. As for the international level, although many studies have examined the determinants of green and sustainable entrepreneurship, the exploration of these determinants in a specific field such as tourism (e.g., refs. [19,20]) or agriculture (e.g., ref. [21]) is considered limited. More precisely, the focus of the existing literature has been to discuss many issues related to the practices (e.g., ref. [22]), antecedents (e.g., refs. [23,24]), financing (e.g., ref. [25]), education (e.g., refs. [26,27]), and barriers of sustainable and green entrepreneurship (e.g., ref. [28]) in different contexts. As for the field of drug waste collection, to the best of our knowledge, there is no previous study that investigated the drivers of establishing green start-up projects (or entrepreneurship) to collect wasted drugs. Therefore, it is expected that investigating behavioral intentions will contribute to increasing the ability of various stakeholders to attract more people wishing to launch new ventures and overcome barriers that can prevent them from creating green start-ups for the purpose of collecting waste drugs.

The “theory of planned behavior” (TPB), proposed by Ajzen [29], provides a useful theoretical approach to systematically investigate the antecedents of green start-up creation. In their systematic review, Maheshwari et al. [30] found that the TPB model is the dominant framework for investigating students’ entrepreneurial intentions. In addition, Kautonen et al. [31] confirmed the importance and robustness of the TPB in predicting the intention of start-up projects. Meanwhile, Mouloudj et al. [5] demonstrated the validity and predictive power of this model in the context of drug waste reduction. However, as emphasized by Maheshwari et al. [30] the formation of students’ entrepreneurial intention is not only influenced by the TPB antecedents but can also be influenced by other factors such as personality, environmental, social, educational, contextual, and demographic factors. Therefore, it would be useful to extend this theory with other constructs. In this sense, this investigation mainly aims to explore predictors of students’ intentions to create start-up projects to collect unwanted drugs through expanding the lenses of the TPB with start-up self-efficacy and drug waste collection-related knowledge. More precisely, this investigation seeks to answer the following two research questions (RQs): RQ1. What are the critical drivers in the intention to create a green start-up to collect unwanted drugs in the context of Algeria? RQ2. Does the extended TPB model improve the predictive ability of behavioral intentions compared to the original TPB model? According to the above, the current paper is expected to contribute to the drug waste management (DWM) literature and green reverse logistics. In addition, this paper is expected to help decision-makers attract more potential entrepreneurs, especially among ambitious university students, to engage in sustainable projects. Hence, this investigation will provide useful insights for academics and professionals in the fields of green/sustainable entrepreneurship, social entrepreneurship, reverse supply chains, and DWM.

The rest of the study is structured as follows. In Section 2, we summarize the study literature and develop the hypotheses. Section 3 describes the research methodology and procedures, including measurement instrument, target population, and sampling. Section 4 projects the empirical results of our investigation. Section 5 provides a discussion of the main results obtained, and also presents practical implications and limitations. Finally, Section 6 briefly presents the conclusions.

2. Literature Review and Research Hypotheses

2.1. Green Start-Up Projects to Collect Unwanted Drugs

Based on their review, Sapkota and Pariatamby [32] (p. 83) reported that “households and healthcare facilities usually dispose of contaminated, unused, or expired medicines with municipal waste”. There is no doubt that these practices have dire effects on human health and the environment [2,10], in addition to the serious harm that may befall waste collection workers, especially when they do not use personal protective equipment [33]. Therefore, to develop sustainable practices, stakeholders should adopt green business models that consider the environmental, social, and economic dimensions [22]. Sapkota and Pariatamby [32] argued that the time has come to adopt sustainable and eco-friendly techniques in the field of drug waste management. On this basis, green start-up projects can effectively contribute to DWM. In other words, green start-up projects in the field of waste management and recycling can play an important role in overcoming environmental problems [34], in addition to contributing to providing job opportunities [35]. Al-Mamary and Alshallaqi [36] stated that entrepreneurship encourages innovation and reduces unemployment.

In practice, the importance of encouraging the creation of start-up companies to collect unwanted drugs is evident for several reasons, including (1) the lack of cooperation of some pharmacists in collecting wasted drugs [17]; (2) lack of drug waste risk perception and lack of awareness/knowledge of safe disposal methods [5,37]; (3) the high volume of wasted drugs, causing significant environmental damage [38]; (4) the absence of drug waste take-back systems in many developing countries [13], and the failure of some of these systems in developed countries; and (5) the willingness of some customers to pay a premium for safe disposal of unwanted drugs [9,11,16] and solid waste [39,40].

In fact, collecting unwanted drugs requires some basic knowledge and skills; such as knowledge regarding processes of separation, packaging, storage, transportation, and disposal of drug waste [1,41]. In general, a collector of unwanted drugs needs to know (1) how to separate unwanted drugs (such as solid drugs, semi-solid drugs, and liquid drugs); (2) how to package unwanted drugs (e.g., boxes or bags and plastic or aluminum foil); (3) how to transport unwanted drugs safely from families to drug collector stores; (4) how to temporarily store the collected drugs (e.g., temperature levels); and (5) how to dispose of these drugs safely, such as transporting them to specialized public centers. However, green start-up projects in the field of collecting unwanted drugs cannot succeed if they do not operate according to a clear strategy and do not receive sufficient support (such as accompaniment, training, and financing) from the authorities. Some studies have reported that the most important factors for the success of green projects include support, “government’s co-funding”, “supply chain collaboration”, and training (e.g., [42]).

Notwithstanding, it must be emphasized that the ability to survive and continue operating is linked to the flow of revenues generated from these projects. Therefore, from an economic perspective, in order for start-up projects to collect unwanted drugs to be able to succeed, continue to work, and achieve their goals, especially economic ones, revenues can be achieved through (1) the green start-up owner asking customers to pay a small fee depending on the number of unwanted drugs, in light of the willingness of some customers to pay the costs of collecting their unwanted drugs [16]; (2) the government paying the costs of collecting unwanted drugs to green start-up owners; or (3) the government, pharmaceutical companies, and customers bearing the costs of collecting unwanted drugs.

2.2. The TPB in the Context of Green Start-Ups

The TPB model is based on the postulation that voluntary human behavior is affected by intention, which in turn is also affected by three constructs: attitudes, subjective norms, and “perceived behavior control”(PBC) [29]. Intention was defined as “the extent of the individual’s willingness to complete the behavior” [43] (p. 208). Accordingly, in the context of our research, behavioral intention refers to a student’s willingness to launch a start-up to collect unwanted drugs in the future. Yi [44] found that green entrepreneurship intention significantly affects students’ green entrepreneurship behavior in the Chinese

context. Therefore, it is likely that the strong intentions of students will translate into actual behaviors to create green start-up projects if conditions remain the same.

Since its emergence, the TPB model has been used extensively to predict green and environmentally friendly behaviors, especially in exploring green entrepreneurship [19,45,46], waste separation intentions [39], waste classification intentions [47], solid waste collection intentions [40], plastic waste reduction intentions [48], and waste sorting behavior [49]. In addition, many researchers have extended the TPB to investigate the intentions of conventional entrepreneurship [50–53], green start-ups [35,54], sustainable start-ups [55,56], and sustainable entrepreneurship [57–59]. All of these studies have demonstrated the importance of adding new constructs to the TPB, and Ajzen [60] (p. 317) also confirmed that “the TPB is, in principle, open to the inclusion of additional predictors”. Therefore, beyond the TPB constructs, studies have shown that green start-ups and entrepreneurship intention and behaviors can be affected by green mindfulness [23], university entrepreneurial support [44], financial support and entrepreneurship culture [61], and entrepreneurial passion [62], among other factors.

In addition, several studies emphasized the role of self-efficacy beliefs in influencing behavioral intention (e.g., refs. [63,64]), while other scholars pointed out the importance of students’ perceived self-efficacy as a determinant of launching entrepreneurship projects [53,64–67], so this construct was integrated into the TPB model. Moreover, given the need of waste drug collectors for necessary knowledge, some researchers have pointed out the role of personnel knowledge in effective waste management [41,68,69]. Zhang et al. [47] found that classification knowledge is an important antecedent of waste classification intention. In turn, Tee et al. [20] and Papp-Váry et al. [70] emphasized the role of students’ knowledge in launching green start-ups. In the same vein, Woromogo et al. [71] affirmed that the level of knowledge influences the attitudes and practices of biomedical waste management among health staff in Cameroon. Kaewchutima et al. [8] reported that proper waste disposal practices were significantly associated with the level of disposal knowledge among students in Thailand. Zhang et al. [72] found that waste classification-related proper knowledge is positively associated with solid waste separation behavior. Also, Vassanadumrongdee and Kittipongvises [39] found that solid waste separation-related knowledge exerts a significant influence on source separation intention. Thus, drug waste collection-related knowledge was incorporated in the original TPB model.

2.3. Developing Research Hypotheses

2.3.1. Attitudes

Ajzen [29] (p. 188) views attitudes as “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question.” In the entrepreneurship literature, it has been reported that attitudes can be influenced by entrepreneurship education [50], altruism and extrinsic reward [18], and self-efficacy [73]. Zhang et al. [47] found that attitude is the strongest determinant of waste classification intention. Empirical evidence supports that positive attitudes can exert a positive effect on individuals’ intention to create green start-ups [35], sustainable start-ups [56], green entrepreneurship [1,24,67,74], sustainable entrepreneurship [18,45,57–59,73,75], and the intention to engage in conventional entrepreneurship [51,52,66]. Furthermore, Aliedan et al. [50] point out that attitudes influence the intention of students to be entrepreneurs. However, Prabowo et al. [46] pointed out that attitude had a non-significant effect on students’ intentions to start green entrepreneurship. Thus, we are in a position to hypothesize the following:

H1. *Attitudes have a positive effect on the intention to create a green start-up to collect unwanted drugs.*

2.3.2. Subjective Norms

Subjective norms are defined by Ajzen [29] (p. 188) as “the perceived social pressure to perform or not to perform the behavior”. Therefore, due to the lack of practical experience, the student’s decision to create a start-up project to collect unwanted drugs

may be influenced by the opinions and advice of close family, professors, friends, and colleagues. For example, Shahzad et al. [76] found that family support and peer influence have a significant indirect impact on start-up venture intentions among business students in Pakistan. As such, a person is not expected to follow through on the process of creating a new project if the people who influence their decision, such as their parents, do not approve of it. In this context, many previous works have reported that subjective norms are an important determinant of intentions to engage in various types of entrepreneurial projects, such as conventional entrepreneurship [50,51,66], green start-ups [35], green entrepreneurship [19,67], and sustainable entrepreneurship [21,57,75,77]. Nonetheless, the results of Prabowo et al. [46] and Yasir et al. [59] indicated that subjective norms do not significantly influence green entrepreneurship intention. Similarly, Thelken and de Jong [58] confirmed that subjective norms do not significantly predict students' intentions to start a new sustainable project. The same results were obtained by Alshagawi and Ghaleb [52] regarding entrepreneurial intentions among Saudi students. Accordingly, we developed the following hypothesis:

H2. *Subjective norms have a positive effect on the intention to create a green start-up to collect unwanted drugs.*

2.3.3. Perceived Behavioral Control (PBC)

Based on Ajzen [29] (p. 183), PBC refers to “the person’s perception of the ease or difficulty of performing the behavior of interest”. Accordingly, we can define PBC in the context of our study as the student’s “perception of the ease or difficulty” of launching a start-up to collect unwanted drugs. Hence, if a student has enough behavioral control over the process of creating a start-up, they will be more likely to act on their intentions “when the opportunity arises” [78]. Behavioral control includes “required skills and abilities; availability or lack of time, money, and other resources; cooperation by other people; and so forth” [60] (p. 315). In Hungary, Papp-Váry et al. [70] stated that the most important barriers students may face when launching green start-ups include lack of financing, competence, and knowledge. In the entrepreneurship literature, several investigations have demonstrated that PBC positively predicts behavioral intention to engage in conventional entrepreneurship [50–52], green start-ups [35], green entrepreneurship [19,46,67], and sustainable entrepreneurship [21,57–59]. In turn, Galván-Mendoza et al. [78] pointed out that PBC has a positive effect on green behavior. Nevertheless, contrary to the assumption of the TPB, Agu [75] found that the effect of PBC is negative and insignificant towards sustainable entrepreneurial intentions among Nigerian students. Therefore, we can propose the following hypothesis:

H3. *PBC has a positive significant effect on the intention to create a green start-up to collect unwanted drugs.*

2.3.4. Start-Up Self-Efficacy

Another key construct that can contribute to the students' intention of creating a green start-up is self-efficacy. In general, self-efficacy is defined as “the belief of an individual in his personal capacity to carry out an activity” [79] (p. 5). Green start-up self-efficacy has been defined by Guo [80] (p. 1) as “individuals' conviction that they can contribute to solving environmental issues and shows self-assurance in their efforts to protect the environment.” In the context of our study, start-up self-efficacy refers to the student's confidence and belief in himself in terms of possessing the competence and capacity necessary to launch a new start-up project for the purpose of collecting unwanted drugs. Alvarez-Risco et al. [34] concluded that support (i.e., “educational, conceptual, and country support”) is an important predictor of students' green entrepreneurial self-efficacy. Previous research has provided empirical evidence that self-efficacy is positively associated with sustainable start-up intention [55,64], green entrepreneurial intention [23,34,67,74,77], green innova-

tion [80,81], and start-up survival [82]. Also, Vuorio et al. [18] suggest that self-efficacy has a positive effect on perceived entrepreneurial feasibility. Asimakopoulos et al. [79] reported that entrepreneurial self-efficacy indirectly affects entrepreneurial intention through social norms. Similarly, Sher et al. [56] affirmed that the relationship between self-efficacy and sustainable start-up intentions is mediated by perceived entrepreneurial feasibility. However, Wang et al. [83] discovered that there was no significant direct or indirect influence of green entrepreneurship self-efficacy on green entrepreneurship intentions. Hence, we can suggest the following hypothesis:

H4. *Start-up self-efficacy has a positive significant effect on the intention to create a green start-up to collect unwanted drugs.*

2.3.5. Drug Waste Collection-Related Knowledge

Drug waste management (DWM) includes “waste collection, packaging, storage, segregation, transport, treatment, and disposal” [1] (p. 2). Therefore, knowing how to collect wasted drugs can be considered an intangible asset in the green start-up project. Jha et al. [84] reported that a lack of knowledge related to the safe disposal of unwanted drugs is widespread even among pharmacy students and pharmacists themselves. In Cyprus, Miamiliotis and Talias [41] found that healthcare personnel have moderate knowledge about infectious drug waste segregation and good knowledge about DWM. In the context of entrepreneurship, Shahzad et al. [76] suggest that entrepreneurial skills and innovativeness have a significant influence on start-up venture intentions. Prabowo et al. [46] revealed that cognition knowledge positively affects green entrepreneurship intention. Similarly, some studies have reported that entrepreneurial knowledge has a positive effect on conventional entrepreneurship intention [50,53] and green entrepreneurship intention [20,24,62]. Furthermore, a study by Cui et al. [42] found that “lack of green technical knowledge” is one of the factors leading to green business failure. Galván-Mendoza et al. [78] indicate that environmental knowledge has a significant influence on PBC and green behavior. Research from Zhang et al. [49] showed that “waste separation-related knowledge” contributes significantly to the formation of positive attitudes towards waste separation behavior, and that attitude, in turn, affects the intention to separate waste. Recently, research by Akhter et al. [85] confirmed a positive relationship between food waste-related knowledge and the intention not to waste. Therefore, it is expected that if students have good drug waste collection-related knowledge, they will form positive intentions toward creating green projects to collect unwanted drugs. Accordingly, it is reasonable to project the following hypothesis:

H5. *Drug waste collection-related knowledge has a positive significant effect on the intention to create a green start-up to collect unwanted drugs.*

3. Materials and Methods

This investigation aims to identify the most important drivers of the intention to create start-up projects to collect unwanted drugs among university students and highlight the importance of extending the TPB model in this setting. For this reason and in light of previous investigations (such as refs. [19–21,23,24,31,34,35]), we chose the questionnaire survey method as a quantitative approach to collect primary data from students. Moreover, in order to determine the percentage of improvement in the predictive ability of the expanded model, we applied hierarchical multiple regression analysis as a commonly used statistical method in this field (e.g., refs. [5,18,39]).

3.1. Participants and Procedure

The study population in this research consists of all students who are pursuing their university education during the current academic year (2023/2024), in the three levels (Bachelor, Master, and Doctorate) in six university poles in northern Algeria (Algiers, Blida, Bouira,

Bejaia, Boumerdes, and Tipaza). Students pursuing specific specializations such as business management, marketing and commerce, pharmacy, medicine and nursing, biology, social sciences, and chemistry were targeted. Students were chosen as a study population for several reasons, including (1) the large number of university students in Algeria (about 1.67 million in this year), as it is expected that a portion of them will initiate start-up projects; (2) the presence of business incubators in most universities to support and accompany students who wish to establish start-up projects; (3) most students in the selected scientific specializations have an acceptable background on how to start a new project; and (4) most previous investigations into intentions to create green start-ups or green entrepreneurship targeted university students as a sample (e.g., refs. [34,35,46,59,65,74,86,87]). For sampling, the authors used a convenience sample method, as in refs. [35,48,88], consisting of 420 students (an average of 70 students at each university), where three authors distributed the questionnaire during the period extending from 1 October 2023 to 5 December 2023. Respondents were met at the main university entrance gates, university residences, and student transportation stations. In the end, 332 questionnaires were obtained with a response rate of 79.05%, of which 328 (98.8%) were suitable for analysis.

3.2. Instrument Development

The current study used a self-administered paper questionnaire as a tool to collect primary data from respondents, and in order to measure the constructs of the proposed model, we adapted the items used in previous empirical investigations to fit the context of our study. Therefore, the first part of the questionnaire was designed to capture demographic data, namely gender, age group, educational level, specializations, and monthly family income, while the second part was developed to measure the model's constructs. In this regard, attitudes toward behavior were assessed using a scale drawn from ref. [5] and ref. [88]. Likewise, both subjective norms and PBC constructs were evaluated using scales adapted from refs. [46,88,89]. Furthermore, start-up self-efficacy was assessed using a scale derived from refs. [34,35]. In addition, drug waste collection-related knowledge was evaluated using a scale obtained from ref. [49]. Finally, the intention towards creating a green start-up was measured using a scale drawn from refs. [34,58]. Respondents were asked to accurately determine their degree of agreement with the nineteen statements (three statements for each construct except for attitudes, where there were four statements), using a "5-point Likert scale", where (1) is "strongly disagree" and (5) is "strongly agree". The measurement tool was originally developed in English, and then two professional translators translated it into Arabic, being the mother tongue of the respondents. Before conducting the intended research project, the authors performed a pilot study with a sample of 20 university students in order to assess the efficacy and adequacy of the measurement items; that is, to verify the reliability and validity of the questions. Accordingly, some minor modifications were made to the questionnaire items. Table 1 shows the final measurement instrument.

Table 1. Measurement of constructs.

Constructs and Item	Source
Attitude (ATT)	
ATT1—I think creating a start-up to collect unwanted drugs is good ethical behavior	[5,88]
ATT2—I believe creating a start-up to collect unwanted drugs is wise and rational behavior	
ATT3—I think creating an unwanted-drug collection start-up is favourable behavior	
ATT4—I think creating an unwanted-drug collection start-up can help protect our environment	
Subjective Norm (SN)	
SN1—If I decided to start a start-up to collect unwanted drugs, my close family would encourage me	[46,88,89]
SN2—My colleagues will support my creation of a start-up to collect unwanted drugs	
SN3—My friends will approve my decision to create a start-up to collect unwanted drugs	
Perceived Behavioural Control (PBC)	
PBC1—For me, it would be easy to create a green start-up to collect unwanted drugs	[46,88,89]
PBC2—Creating a green start-up to collect unwanted drugs is under my control	
PBC3—I have enough resources to create a green start-up to collect unwanted drugs	

Table 1. Cont.

Constructs and Item	Source
Start-Up Self-Efficacy (SSE)	
SSE1—I have complete confidence in my ability to create a start-up to collect unwanted drugs	
SSE2—I have confidence in my ability to meet the challenges that can hold me back while creating and managing an unwanted drug collection project	[34,35]
SSE3—I believe I can create a start-up to collect unwanted drugs	
Drugs Waste Collection-related Knowledge (DWCK)	
DWCK1—I know how to collect waste drugs properly	
DWCK2—I have good knowledge about how to sort unwanted drugs	[49]
DWCK3—I know how to dispose of unwanted drugs safely	
Intentions (IN)	
IN1—I will do my best to create a start-up to collect unwanted drugs in the future	
IN2—I plan to create a start-up to collect unwanted drugs in the future	[34,58]
IN3—I am willing to create a start-up to collect unwanted drugs in the future	

3.3. Analysis Strategy

Data were analyzed using IBM SPSS 26 (“IBM Corporation, Armonk, NY, USA”). To determine the respondents’ characteristics, frequencies, and percentages were used. Also, means and standard deviation (SD) scores were measured for all six constructs of the study model. Additionally, reliability was checked using Cronbach’s alpha. In addition, the skewness and kurtosis statistics were used to assess the normality, while the “variance inflation factor”(VIF) and tolerance statistics were used to test the multicollinearity problem. To test the hypotheses, we applied multiple hierarchical regression analysis, and considered the p -value < 0.05 to be significant. The aim of choosing hierarchical regression was to determine the contribution of each antecedent in explaining intentions to engage in creating green start-ups to collect unwanted drugs, in addition to exploring the importance of incorporating additional constructs with the original TPB model.

4. Results

4.1. Respondents’ Characteristics

As presented in Table 2, among the 328 respondents, 53.66% were male students, and 46.34% were female students. Most respondents (29.27%) were aged 22 to 25 years. Furthermore, 38.42% of respondents were studying at the bachelor’s level and 45.12% were studying at the master’s level. Regarding specialization, approximately 22% of the respondents were business management students and about 20% were marketing and commerce students. In addition, the monthly family income of 37.19% of respondents ranged between DZD 40,000 and 60,000.

Table 2. Profiles of respondents ($N = 328$).

Variables	Items	Frequency	Percentage
Gender	Male	176	53.66
	Female	152	46.34
Age (years)	18–21	73	22.26
	22–25	96	29.27
	26–30	75	22.86
	31–35	51	15.55
	>35	33	10.06
Education level	Bachelor student	126	38.42
	Master student	148	45.12
	Doctoral student	54	16.46

Table 2. Cont.

Variables	Items	Frequency	Percentage
Specializations	Business Management	71	21.65
	Marketing and Commerce	64	19.51
	Pharmacy	49	14.94
	Medicine and Nursing	56	17.07
	Biology	35	10.67
	Other	53	16.16
Monthly household income (DZD)	<40,000	75	22.87
	40,000–60,000	122	37.19
	60,001–80,000	68	20.73
	>80,000	53	16.16
	Missing	10	03.05

4.2. Descriptive Data Analysis

Table 3 presents the correlation matrix. Therefore, score means and standard deviations (SDs) were calculated for all the constructs. Accordingly, respondents were found to have strong intentions to create green start-up ventures to collect unwanted drugs ($M = 4.05$), positive attitudes toward creating this type of venture ($M = 3.80$), high subjective norms ($M = 3.54$), and high PBC ($M = 3.65$). They also have high self-efficacy with regard to their ability to launch these projects ($M = 3.78$). Meanwhile, it was found that they had a low drug waste collection-related knowledge ($M = 2.45$). In addition, Cronbach's Alpha values ranged between 0.802 (for intention) and 0.941 (for subjective norm), thus exceeding the threshold of 0.7 suggested by Henseler et al. [90].

Table 3. Descriptive statistics and correlation matrix.

Constructs	1	2	3	4	5	6
1. Attitudes	-					
2. Subjective norms	0.540 **	-				
3. PBC	0.596 **	0.651 **	-			
4. SSE	0.804 **	0.557 **	0.641 **	-		
5. DWCK	0.586 **	0.540 **	0.496 **	0.616 **	-	
6. Intention	0.671 **	0.591 **	0.652 **	0.693 **	0.611 **	-
Mean	3.80	3.54	3.65	3.78	2.45	4.05
SD	0.62	0.80	0.76	0.75	0.73	0.61
Cronbach's Alphas	0.828	0.941	0.910	0.855	0.931	0.802
Skewness	−0.941	−1.015	−1.223	−1.351	−0.363	−0.966
Kurtosis	1.406	1.200	1.803	2.236	−0.284	1.319

Note: ** Correlation is significant at the 0.01 level (2-tailed). Perceived behavioral control (PBC), start-up self-efficacy (SSE), and drug waste collection-related knowledge (DWCK).

As shown in Table 3, correlation coefficients were computed, and all constructs were positively and significantly associated with each other. Intentions to create green start-ups to collect unwanted drugs were positively connected with attitudes ($r = 0.67$, $p < 0.01$), subjective norms ($r = 0.59$, $p < 0.01$), and PBC ($r = 0.65$, $p < 0.01$). Likewise, students' intentions were positively associated with self-efficacy ($r = 0.69$, $p < 0.01$) and drug waste collection-related knowledge ($r = 0.61$, $p < 0.01$).

Before moving on to testing the research hypotheses, we conducted a normality test. For this reason, the values of skewness and kurtosis were calculated. Mouloudj and Bouarar [43] (p. 212) pointed out that “the data follows a normal distribution if the values of skewness range between ± 2 and values of kurtosis range between ± 7 ”. As shown in Table 3, the skewness values ranged between -1.351 and -0.363 , and the kurtosis values ranged between -0.284 and 2.236 ; this means that the condition of normality is met, and therefore we can conduct multiple regression tests.

4.3. Hypotheses Testing

Multicollinearity was examined through “variance inflation factor” (VIF) and tolerance. As indicated by Hair et al. [91], the results presented in Table 4 indicate that the VIF values were less than the threshold of 5, and the tolerance values were higher than the threshold of 0.2. Hence, there was no concern about multicollinearity. Next, we conducted hierarchical multiple regression analysis to test the hypotheses of the proposed model, where three models were considered. On this basis, Model 1 included the original TPB constructs, in Model 2 the self-efficacy was combined with TPB, and in Model 3 the construct of drug waste collection-related knowledge was added to Model 2.

Table 4. Results of hierarchical regression analysis.

Models		B	t	Sig	Tolerance	VIF	F	R ² (Adjusted R ²)
Model 1	(constant)	1.231	8.652	0.000				0.567 (0.563)
	ATT	0.385	8.372	0.000	0.605	1.653	141.449	
	SNs	0.140	3.726	0.000	0.541	1.849	(<i>p</i> < 0.001)	
	PBC	0.236	5.700	0.000	0.492	2.033		
Model 2	(constant)	1.262	9.081	0.000				0.590 (0.584)
	ATT	0.217	3.621	0.000	0.338	2.960	115.980	
	SNs	0.125	3.386	0.001	0.535	1.868	(<i>p</i> < 0.001)	
	PBC	0.190	4.560	0.000	0.459	2.178		
	SSE	0.218	4.207	0.000	0.310	3.223		
Model 3	(constant)	1.329	9.732	0.000				0.610 (0.604)
	ATT	0.182	3.081	0.002	0.331	3.022	100.813	
	SNs	0.088	2.375	0.018	0.504	1.982	(<i>p</i> < 0.001)	
	PBC	0.187	4.594	0.000	0.459	2.179		
	SSE	0.169	3.246	0.001	0.294	3.403		
	DWCK	0.161	4.131	0.000	0.552	1.812		

Note: Attitude (ATT), subjective norms (SNs), perceived behavioral control (PBC), start-up self-efficacy (SSE), and drug waste collection-related knowledge (DWCK).

As shown in Table 4, based on the outcomes of Model 1, attitude had a positive and significant effect on students’ intentions to create green start-ups to collect unwanted drugs ($\beta = 0.385$, $p < 0.001$); thus, H1 is confirmed. Furthermore, the results also demonstrated that subjective norms positively affected intentions to create green start-ups ($\beta = 0.140$, $p < 0.001$); as a result, H2 is accepted. In addition, the analysis also showed that PBC had a significant impact on intentions to create green start-ups ($\beta = 0.236$, $p < 0.001$); therefore, H3 is supported. The results also show that the original TPB constructs explained 56.30% of the variance in students’ behavioral intentions to create green start-ups.

The results of Model 2 reveal that attitude ($\beta = 0.217$, $p < 0.001$), subjective norms ($\beta = 0.125$, $p = 0.001$), PBC ($\beta = 0.190$, $p < 0.001$), and start-up self-efficacy ($\beta = 0.218$, $p < 0.001$) have a positive and significant effect on intentions to create green start-ups. As a result, H4 is supported. In addition, the empirical results reveal that the integrating self-efficacy with the TPB constructs was able to explain 58.40% of the variance in students’ intentions.

Additionally, the results of Model 3 show that attitude ($\beta = 0.182$, $p = 0.002$), subjective norms ($\beta = 0.088$, $p < 0.05$), PBC ($\beta = 0.187$, $p < 0.001$), start-up self-efficacy ($\beta = 0.169$, $p = 0.001$), and drug waste collection-related knowledge ($\beta = 0.161$, $p < 0.001$) have a positive and significant effect on intentions to create green start-ups. As a result, H5 is confirmed. Moreover, the results obtained reveal that adding self-efficacy and drug waste collection-related knowledge with the TPB constructs explained 60.40% of the variance in students’ behavioral intentions, and this indicates an improvement in the predictive power of the expanded model by 4.10% compared to the original TPB model.

Based on the results shown above, five hypotheses were tested, and all hypotheses, H1, H2, H3, H4, and H5, were accepted. The results clearly indicate that attitude, subjective

norms, PBC, start-up self-efficacy, and drug waste collection-related knowledge are significant drivers of intentions to create green start-up projects for the purposes of collecting unwanted drugs.

5. Discussion, Practical Implications, and Limitations

5.1. Discussion

The aim of this paper was to predict students' intentions to create green start-ups to collect unwanted drugs by including start-up self-efficacy and drug waste collection-related knowledge into the TPB. In this regard, it is expected that this paper will contribute effectively to the debate on finding sustainable solutions to reduce the problem of drug waste.

In the beginning, in contrast to the results of Agu [75], which revealed that PBC negatively and non-significantly affected students' intentions to engage in sustainable entrepreneurship, our results confirmed that PBC was the strongest antecedent of intentions towards creating green start-ups in order to collect unwanted drugs in the Algerian context. In this regard, Bouarar et al. [35] supported that PBC is a strong antecedent of creating green start-ups among Algerian students. In turn, Hoogendoorn et al. [28] confirmed that "a lack of financial, administrative, and informational support" are the most important challenges facing creating sustainable start-ups. Makki et al. [26] found that lack of knowledge is one of the barriers to green entrepreneurship. This means that (1) the effect of PBC on behavioral intentions may vary from one context to another depending on the nature of the facilities and resources available, and (2) the availability of the necessary resources and skills plays a decisive role when students think about launching a start-up project to collect unwanted drugs. Therefore, it is unreasonable for students to engage in such projects if they believe that the task will be technically complex and require greater skills and that the project may fail at the beginning. Similar results were also achieved by Lopes et al. [57], Mehraj et al. [19], Prabowo et al. [46], Lang et al. [21], Thelken and de Jong [58], and Yasir et al. [59], who empirically demonstrated that PBC has a significant effect on green and sustainable entrepreneurship intentions. Accordingly, we conclude that the perception of difficulties may thwart the idea of launching a start-up project. As soon as potential entrepreneurs perceive the presence of obstacles during the first stage (launch) or the advanced stages (expanding and growing the project), they may abandon this idea. On the contrary, the perceived ease of implementing a green start-up project to collect unwanted drugs will encourage students to ultimately implement it without fear of failure.

Our results confirmed that attitudes are the second most important antecedent of intentions to create green start-ups, indicating that strong positive attitudes can generate the intention to engage in green start-up projects to collect unwanted drugs. Therefore, students who have positive attitudes toward green start-ups may be more willing to engage in the experience of creating a green start-up project, and they are also more eager to research and learn about how to create a start-up company. Previous evidence has also demonstrated that attitudes can be a contributing factor to engaging in green and sustainable entrepreneurship [19,21,24,45,67,73–75]. The result of Sher et al. [56] is consistent with the significant influence of attitudes on launching a sustainable start-up. Likewise, a paper by Bouarar et al. [35] also determined that positive attitudes have a significant impact on the intention to engage in green start-up projects.

Furthermore, our results suggest that start-up self-efficacy is the third most important antecedent of intentions to create green start-ups. This indicates that students who have higher green start-up self-efficacy "will have more confidence, ability, strength and belief in themselves" [81], which may generate stronger intentions to engage in green projects to collect unwanted drugs. Conversely, if a student feels the desire to create a green start-up "but does not perceive high levels of self-efficacy, he or she will not intend to do so" [55] (p. 9). This result supports the results of several previous empirical works that perceived self-efficacy has a positive impact on green entrepreneurship intentions directly [23,34,55,67,74,77,89] and indirectly [56,79]. Self-efficacy is "termed as an enabling factor in recognizing the opportunity of an entrepreneurial startup" [80] (p. 2), and it is

also “a central personality characteristic that contributes to the understanding of what drives the successful growth of start-ups” [82] (p. 1043). However, as a result of a lack of experience, some students may perceive that they have high self-efficacy, but when they actually begin entrepreneurial work, they find that their skills are insufficient and that they must acquire more knowledge and skills to achieve the desired success. Therefore, we claim that self-efficacy, no matter how high, always needs development, especially in light of the era of digital technology, which requires continuous learning and training.

In addition, the results showed that drug waste collection-related knowledge is a significant antecedent of intentions towards creating green start-ups. This means that the basic knowledge (tacit and explicit knowledge) about how to perform the activities of collecting unwanted drugs plays an important role in forming the intention to create a start-up company to collect these drugs. In this context, Jalal et al. [69] found that knowledge of bio-medical waste management among healthcare workers is related to gender, educational level, and professional experience. Recently, Papp-Váry et al. [70] (p. 9) reported that college students (Generation Z) have a lot of uncertainty and fear towards green start-ups, which may be due to “a lack of appropriate knowledge and practical knowledge”. Furthermore, Michael et al. [4] recommended the need to integrate “pharmaceutical waste management lectures” into university education curricula. The results of Noor et al. [62], Roy [24], and Tee et al. [20] are in line with the significant influence of entrepreneurial knowledge on green entrepreneurial intention. In fact, pharmacy and medical students may have better knowledge regarding the types, classification, ingredients, toxicity, and risks of drugs compared to students of other specializations. Nevertheless, drug waste collection-related knowledge, including technical and management knowledge, and safety and security risk knowledge (such as the risks to which collectors are exposed) is a necessary requirement for every student (or any other person) wishing to engage in waste collection activities [8,41,68,69,71].

Finally, the results demonstrated that subjective norms had a significant effect on green start-up venture intentions, yet a smaller effect compared to the other antecedents. This means that students’ decisions regarding planning to launch green projects to collect unwanted drugs may be influenced by the information and advice they receive from people whose opinions they value. For example, students may consult their professors or people with experience in the field of entrepreneurship about the idea of creating a start-up to collect unwanted drugs, especially since most students do not have previous experiences that would qualify them to make important decisions like this. Moreover, many students lack financial resources, which forces them to request financial support from other people, especially family members. In this case, they must convince them of the feasibility of launching a green start-up project, and during this, the advantages and difficulties are discussed, which ultimately leads to approval or rejection of the idea of the proposed start-up project. This result supports previous investigations which confirmed that subjective norms significantly predict individuals’ intentions to engage in green entrepreneurial projects (e.g., refs. [19,57,67,75–77]). It should be noted that the level of effect of social influence, in such cases, on the student’s intentions may be affected by several factors, including personal traits, educational level, and experience of subjective norm, as well as the perception of information quality provided by members of reference groups.

5.2. Practical Implications

The obtained results of the empirical study have several practical implications, which may assist different stakeholders, including policymakers. In this vein, our study revealed that the formation of students’ intentions to engage in creating start-ups specialized in collecting unwanted drugs can be predicted by the TPB constructs model along with self-efficacy and knowledge related to waste collection. Therefore, to form positive attitudes towards creating start-ups to collect unwanted drugs, several efforts must be dedicated to strengthening positive attitudes. On the other hand, efforts also must be invested to transform neutral and negative attitudes into positive ones by providing students

with economic, environmental, and social advantages and motivations to create green projects to collect wasted drugs. It is also possible to form positive attitudes for students towards green start-ups through the language of money (personal benefits) and how these specific projects, if successful, can generate suitable profits for them. Accordingly, conventional media and social media platforms could be effective tools for broadcasting promotional campaigns aimed at building favorable attitudes toward these projects (see Papp-Váry et al. [70]). Furthermore, promotional activities focused on subjective norms, especially those conducted by opinion leaders (such as university professors) among students, can enhance positive intentions. Some professors enjoy the great ability to influence their students' decisions by advising, guiding, and providing them with reliable scientific information. Moreover, students may be greatly influenced by their parents' opinions, especially since launching a new project requires family financial and moral support. Therefore, convincing parents of the feasibility of these projects may contribute to making parents take the initiative to propose and discuss the idea of engaging in such projects. In addition, religious scholars and leaders may have an effective impact on religiously committed students by motivating them to engage in sustainable activities that provide benefits to society, and the environment, in addition to being a business aimed at making money. As for the difficulties that some students may face before launching their start-ups or after starting the activity, various stakeholders must contribute to overcoming these difficulties. The government can provide financial support; the MKESME can provide information, accompaniment, and solutions to solve administrative problems; the Ministry of Health can provide technical support experts; and the MHESR can provide appropriate training. Pharmaceutical manufacturing companies can also play the role of an intermediary (main collection center) that receives drug waste from start-ups and then delivers it to pharmaceutical waste disposal centers. Therefore, different parties need to dedicate their efforts in line with a unified vision to overcome any obstacles that may prevent the effective implementation of such types of start-up projects.

In addition, self-efficacy and knowledge regarding waste collection are important antecedents of intentions to engage in start-ups to collect unwanted drugs. Therefore, students' confidence in their abilities and personal skills to engage in such projects should be strengthened to make them feel that they are capable and possess sufficient and necessary skills to manage, maintain, and develop their start-ups. This could be achieved by providing brochures and/or videos that explain and illustrate the various tasks and stages of collecting waste drugs and present previous successful experiences of university students who have been through the same process. Regarding knowledge related to the collection of waste drugs, it is important to provide students with the necessary knowledge that the process of collecting unwanted drugs requires, either administrative knowledge or technical knowledge. Providing reliable knowledge may generate positive attitudes toward the collection of drug waste among students and draw their attention to possible opportunities in their environment, and this may prompt them to make their projects reality. In this context, training courses and workshops led by experts and doctors specialized in collecting drug waste can be organized for students. A university, through specialized professors, can also provide students with important information about how to implement such projects. In addition, the inclusion of waste management courses and techniques within the entrepreneurship specialization curriculum will significantly contribute to obtaining more knowledge of the details of such activities (see Michael et al. [4]). In this context, Qazi et al. [88] (p. 1154) confirmed that "university green entrepreneurial support results in positive green entrepreneurial intention".

5.3. Strengths and Limitations of Study

The contribution of this study is expected to effectively contribute to solving unwanted drug problems; however, our study is not without limitations that should be pointed out, which could serve as the starting points for future research projects. First, our study examined intentions to create green start-up projects to collect unwanted drugs in the

Algerian context, and therefore the findings may not be generalizable to non-similar contexts. Therefore, future studies could explore these intentions in different environmental, social, economic, and cultural contexts in order to develop comprehensive conclusions. The current study model can also be applied to investigate green business intentions to collect various types of waste, such as plastic waste, glass, electronic products, bread, building materials, and others. Secondly, our study focused on expanding the TPB model by annexing self-efficacy and knowledge related to waste collection to the model, and undoubtedly other constructs may have an impact on intentions to create green start-ups to collect waste drugs. Therefore, future investigations could extend the TPB with other constructs such as environmental values, religious values, moral values, benefit perception, and risk perception of pharmaceutical waste collection. It is also expected that including family support, government support, social support, and university support as mediating variables and/or including the student's scientific specialization, experience, gender, and family income level as moderating variables will contribute to filling some of the research gaps in this research field. Third, our study investigated behavioral intentions through the TPB approach, while applying other theories and models, such as attitude-behavior-context (ABC) theory, self-determination theory, and entrepreneurial event model, or mixing them may lead to the accumulation of existing knowledge. Fourth, our study examined intentions to create green start-up projects to collect unwanted drugs, while other studies have examined intentions to reduce drug waste from the perspective of customers (e.g., ref. [5]). However, these projects may face difficulties in finding families who have unwanted drugs. Therefore, it would be very useful to investigate the determinants of technology adoption by sustainable entrepreneurship to collect waste drugs and to explore the willingness of customers to use applications and systems used for this purpose in different contexts, including the context of remote areas. Fifth, although the questionnaire survey method is commonly used in studies of behavioral intentions in the field of green entrepreneurship, future investigations could use other methods such as expert assessments or interviews by applying cluster analysis or structural equation modeling. Sixth, there is another possible limitation: our study examined students' intentions from different specialties without focusing on a specific specialty, and certainly the level of knowledge related to the collection of unwanted drugs varies between different specialties, so capturing the role and source of such knowledge in shaping behavioral intentions by focusing on a specific specialty deserves further discussion. It would also be interesting to understand the impact of different types of knowledge (technical knowledge of waste collection, procedural knowledge, administrative knowledge, drug waste management knowledge, etc.) on encouraging students to engage in such sustainable projects. Finally, studies that examine the barriers (such as regulatory, administrative, legal, and financial barriers) that may hinder the creation of green start-ups to collect unwanted drugs can provide various stakeholders with insights that can help them design more effective strategies for managing wasted drugs.

6. Conclusions

Waste in general, especially hazardous waste, may cause harm to humans, animals, plants, and water [10,33,47]. Therefore, it is very important to dispose of it properly [2,4]. Moreover, in light of the lack of customer awareness, the lack of cooperation of some pharmacists, and the lack of unwanted drug return facilities (i.e., collection projects), encouraging the establishment of green start-up projects to collect unwanted drugs can be considered a sustainable and effective solution to reduce the environmental, social, and economic costs of wasting drugs. Accordingly, in order to fill the wide research gap in this field, this paper investigated the drivers of intention to create green start-up projects to collect unwanted drugs among students. To achieve this purpose, the TPB model was expanded with start-up self-efficacy and drug waste collection-related knowledge. The results obtained indicate that intentions to engage in creating green start-up projects are driven by PBC, attitudes, start-up self-efficacy, drug waste collection-related knowledge, and subjective norms. Together, these variables explained 60.40% of the variance in students'

behavioral intentions, providing valuable information to stakeholders about the nature of interventions they can use to motivate students who are ambitious and interested in creating green innovative projects. Furthermore, the incorporation of self-efficacy and knowledge into the TPB adds an explanatory power of 4.10%, thus indicating the importance of extending the TPB when investigating green entrepreneurship intentions and behaviors in practice, although many start-up projects can fail to continue. However, in the age of digital technology, it seems that waste drug collection projects can benefit from available emerging technologies (e.g., blockchain, artificial intelligence, big data, apps, and drones) to reduce costs and improve the quality of services provided, which may maximize their chances of success. In conclusion, it can be said that the responsibility of encouraging students (and other people) to take the initiative to create green start-up projects and work to collect unwanted drugs falls on all stakeholders, including the government, pharmaceutical companies, and universities.

Author Contributions: Conceptualization, K.M., A.C.B., A.N. and M.A.E.; methodology, A.C.B. and D.M.A.; software, S.M.; validation, K.M., A.N., M.A.E. and D.M.A.; formal analysis, A.C.B. and K.M.; investigation, S.M. and A.B.; resources, A.B.; data curation, S.M. and A.B.; writing—original draft preparation, K.M., A.C.B. and S.M.; writing—review and editing, A.N. and M.A.E.; visualization, D.M.A. and M.A.E.; supervision, K.M.; project administration, A.N. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Due to this study relying on an anonymous questionnaire, ethics committee approval was not considered necessary in this study in accordance with the local legislation. Hence, this is not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are contained within the article.

Acknowledgments: The authors thank all respondents for their time and effort in completing the questionnaire.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Mohammed, S.A.; Kahissay, M.H.; Hailu, A.D. Pharmaceuticals wastage and pharmaceuticals waste management in public health facilities of Dessie town, North East Ethiopia. *PLoS ONE* **2021**, *16*, e0259160. [[CrossRef](#)] [[PubMed](#)]
2. Hajj, A.; Domiati, S.; Haddad, C.; Sacre, H.; Akl, M.; Akel, M.; Tawil, S.; Abramian, S.; Zeenny, R.M.; Hodeib, F.; et al. Assessment of knowledge, attitude, and practice regarding the disposal of expired and unused medications among the Lebanese population. *J. Pharm. Policy Pract.* **2022**, *15*, 107. [[CrossRef](#)]
3. Kahssay, S.W.; Hammesso, W.W.; Getachew, D.; Woldelessie, B.D. Prevalence and determinants of household medication storage during the COVID-19 outbreak in Southwest Ethiopia. *Drug Healthc. Patient Saf.* **2023**, *15*, 1–11. [[CrossRef](#)] [[PubMed](#)]
4. Michael, I.; Ogbonna, B.; Sunday, N.; Anetoh, M.; Matthew, O. Assessment of disposal practices of expired and unused medications among community pharmacies in Anambra State southeast Nigeria: A mixed study design. *J. Pharm. Policy Pract.* **2019**, *12*, 12. [[CrossRef](#)] [[PubMed](#)]
5. Mouloudj, K.; Njoku, A.; Asanza, D.M.; Bouarar, A.C.; Evans, M.A.; Mouloudj, S.; Bouarar, A. Modeling predictors of medication waste reduction intention in Algeria: Extending the theory of planned behavior. *Int. J. Environ. Res. Public Health* **2023**, *20*, 6584. [[CrossRef](#)] [[PubMed](#)]
6. Toe, J.; Orok, E.; Erah, P. Assessment of knowledge and disposal practices of unused and expired household medicines in a community in Liberia. *Explor. Res. Clin. Soc. Pharm.* **2023**, *12*, 100369. [[CrossRef](#)] [[PubMed](#)]
7. Woldeyohanins, A.E.; Adugna, M.; Mihret, T.; Kifle, Z.D. Knowledge, attitude, and practices of unused medications disposal among patients visiting public health centers in Gondar Town, Ethiopia: A cross-sectional study. *J. Environ. Public Health* **2021**, *2021*, 5074380. [[CrossRef](#)] [[PubMed](#)]
8. Kaewchutima, N.; Precha, N.; Duangkong, N.; Jitbanjong, A.; Dwipayanti, N.M.U. Knowledge and practice of facemask disposal among university students in Thailand: A new normal post the COVID-19 pandemic. *PLoS ONE* **2023**, *18*, e0284492. [[CrossRef](#)] [[PubMed](#)]
9. Alajärvi, L.; Lehtimäki, A.-V.; Timonen, J.; Martikainen, J. Willingness to pay for implementation of an environmentally friendly pharmaceutical policy in Finland—A discrete choice experiment study. *Int. J. Environ. Res. Public Health* **2022**, *19*, 6535. [[CrossRef](#)]
10. Desai, M.; Njoku, A.; Nimo-Sefah, L. Comparing environmental policies to reduce pharmaceutical pollution and address disparities. *Int. J. Environ. Res. Public Health* **2022**, *19*, 8292. [[CrossRef](#)]

11. Wang, X.; Howley, P.; Boxall, A.B.; Rudd, M.A. Behavior, preferences, and willingness to pay for measures aimed at preventing pollution by pharmaceuticals and personal care products in China. *Integr. Environ. Assess. Manag.* **2016**, *12*, 793–800. [\[CrossRef\]](#)
12. Banjar, H.; Alrowithi, R.; Alhadrami, S.; Magrabi, E.; Munshi, R.; Alrige, M. An intelligent system for proper management and disposal of unused and expired medications. *Int. J. Environ. Res. Public Health* **2022**, *19*, 2875. [\[CrossRef\]](#) [\[PubMed\]](#)
13. Chisholm, J.M.; Zamani, R.; Negm, A.M.; Said, N.; Abdel Daiem, M.M.; Dibaj, M.; Akrami, M. Sustainable waste management of medical waste in African developing countries: A narrative review. *Waste Manag. Res.* **2021**, *39*, 1149–1163. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Rogowska, J.; Zimmermann, A. Household pharmaceutical waste disposal as a global problem—A review. *Int. J. Environ. Res. Public Health* **2022**, *19*, 15798. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Abahussain, E.; Waheedi, M.; Koshy, S. Practice, awareness and opinion of pharmacists toward disposal of unwanted medications in Kuwait. *Saudi Pharm. J.* **2012**, *20*, 195–201. [\[CrossRef\]](#) [\[PubMed\]](#)
16. Kusturica, M.P.; Golocorbin-Kon, S.; Ostojic, T.; Kresoja, M.; Milovic, M.; Horvat, O.; Dugandzija, T.; Davidovac, N.; Vasic, A.; Tomas, A. Consumer willingness to pay for a pharmaceutical disposal program in Serbia: A double hurdle modeling approach. *Waste Manag.* **2020**, *104*, 246–253. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Chong, K.M.; Rajiah, K.; Chong, D.; Maharajan, M.K. Management of medicines wastage, returned medicines and safe disposal in Malaysian community pharmacies: A qualitative study. *Front. Med.* **2022**, *9*, 884482. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Vuorio, A.M.; Puumalainen, K.; Fellnhofer, K. Drivers of entrepreneurial intentions in sustainable entrepreneurship. *Int. J. Entrep. Behav. Res.* **2018**, *24*, 359–381. [\[CrossRef\]](#)
19. Mehraj, D.; Islam, M.I.; Qureshi, I.H.; Basheer, S.; Baba, M.M.; Nissa, V.; Shah, M.A. Factors affecting entrepreneurial intention for sustainable tourism among the students of higher education institutions. *Cogent Bus. Manag.* **2023**, *10*, 2256484. [\[CrossRef\]](#)
20. Tee, M.; Chaw, L.-Y.; Khan, S.M. Are Knowledge Management and Green Entrepreneurial Knowledge the Rescuer of Sustainable Tourism Post COVID-19 Pandemic. In *Entrepreneurship and Green Finance Practices*; Raza, S.A., Tunio, M.N., Ali, M., Puah, C.H., Eds.; Emerald Publishing Limited: Leeds, UK, 2023; pp. 193–217. [\[CrossRef\]](#)
21. Lang, L.D.; Tiwari, A.K.; Hieu, H.N.; Ha, N.M.; Gaur, J. The role of structural social capital in driving social-oriented sustainable agricultural entrepreneurship. *Energy Econ.* **2023**, *124*, 106855. [\[CrossRef\]](#)
22. Kimuli, S.N.L.; Sendawula, K.; Nagujja, S. Sustainable entrepreneurship practices in women-owned micro enterprises using evidence from Owino market, Kampala, Uganda. *Afr. J. Econ. Manag. Stud.* **2022**, *13*, 508–523. [\[CrossRef\]](#)
23. Alshebami, A.S.; Fazal, S.A.; Seraj, A.H.A.; Al Marri, S.H.; Alsultan, W.S. Fostering potential entrepreneurs: An empirical study of the drivers of green self-efficacy in Saudi Arabia. *Discov. Sustain.* **2024**, *5*, 21. [\[CrossRef\]](#)
24. Roy, S.K. Factors influencing undergraduate students' green entrepreneurial intentions: Evidence from an emerging economy. *Entrep. Educ.* **2023**, *6*, 365–398. [\[CrossRef\]](#)
25. Sohail, M.T.; Din, N.M. How does formal credit promote green entrepreneurship? New insights from renewable energy producers in high-, middle-, and low-income countries. *Environ. Sci. Pollut. Res.* **2024**, *31*, 2869–2882. [\[CrossRef\]](#)
26. Makki, A.A.; Alidrisi, H.; Iqbal, A.; Al-Sasi, B.O. Barriers to green entrepreneurship: An ISM-Based investigation. *J. Risk Financ. Manag.* **2020**, *13*, 249. [\[CrossRef\]](#)
27. Del Vecchio, P.; Secundo, G.; Mele, G.; Passiante, G. Sustainable entrepreneurship education for circular economy: Emerging perspectives in Europe. *Int. J. Entrep. Behav. Res.* **2021**, *27*, 2096–2124. [\[CrossRef\]](#)
28. Hoogendoorn, B.; van der Zwan, P.; Thurik, R. Sustainable Entrepreneurship: The Role of Perceived Barriers and Risk. *J. Bus. Ethics* **2019**, *157*, 1133–1154. [\[CrossRef\]](#)
29. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [\[CrossRef\]](#)
30. Maheshwari, G.; Kha, K.L.; Arokiasamy, A.R.A. Factors affecting students' entrepreneurial intentions: A systematic review (2005–2022) for future directions in theory and practice. *Manag. Rev. Q.* **2023**, *73*, 1903–1970. [\[CrossRef\]](#)
31. Kautonen, T.; Van Gelderen, M.; Fink, M. Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrep. Theory Pract.* **2015**, *39*, 655–674. [\[CrossRef\]](#)
32. Sapkota, B.; Pariatamby, A. Pharmaceutical waste management system—Are the current techniques sustainable, eco-friendly and circular? A review. *Waste Manag.* **2023**, *168*, 83–97. [\[CrossRef\]](#)
33. Njoku, A.; Agbalenyo, M.; Laude, J.; Ajibola, T.F.; Attah, M.A.; Sarko, S.B. Environmental injustice and electronic waste in Ghana: Challenges and recommendations. *Int. J. Environ. Res. Public Health* **2024**, *21*, 25. [\[CrossRef\]](#) [\[PubMed\]](#)
34. Alvarez-Risco, A.; Mlodzianowska, S.; García-Ibarra, V.; Rosen, M.A.; Del-Aguila-Arcentales, S. Factors affecting green entrepreneurship intentions in business university students in COVID-19 pandemic times: Case of Ecuador. *Sustainability* **2021**, *13*, 6447. [\[CrossRef\]](#)
35. Bouarar, A.C.; Mouloudj, S.; Makhlouf, A.; Mouloudj, K. Predicting Students' Intentions to Create Green Start-ups: A Theory of Planned Behaviour Approach. In *SHS Web of Conferences*; EDP Sciences: Ulys, France, 2022; Volume 135, p. 01002. [\[CrossRef\]](#)
36. Al-Mamary, Y.H.; Alshallaqi, M. Impact of autonomy, innovativeness, risk-taking, proactiveness, and competitive aggressiveness on students' intention to start a new venture. *J. Innov. Knowl.* **2022**, *7*, 100239. [\[CrossRef\]](#)
37. Alnahas, F.; Yeboah, P.; Flidel, L.; Abdin, A.Y.; Alhareth, K. Expired medication: Societal, regulatory and ethical aspects of a wasted opportunity. *Int. J. Environ. Res. Public Health* **2020**, *17*, 787. [\[CrossRef\]](#)
38. Alemu, A.B.; Ibrahim, N.A.; Argaw, K.W. Magnitude of medicine wastage and perceived contributing factors among public health facilities in Dire-Dawa City administration, in mid COVID-19 pandemic in Ethiopia: Retrospective, Cross-Sectional Study. *Integr. Pharm. Res. Pract.* **2023**, *12*, 61–75. [\[CrossRef\]](#) [\[PubMed\]](#)

39. Vassanadumrongdee, S.; Kittipongvises, S. Factors influencing source separation intention and willingness to pay for improving waste management in Bangkok, Thailand. *Sustain. Environ. Res.* **2018**, *28*, 90–99. [\[CrossRef\]](#)
40. Wang, Z.; Dong, X.; Yin, J. Antecedents of urban residents' separate collection intentions for household solid waste and their willingness to pay: Evidence from China. *J. Clean. Prod.* **2018**, *173*, 256–264. [\[CrossRef\]](#)
41. Miamiliotis, A.S.; Talias, M.A. Healthcare workers' knowledge about the segregation process of infectious medical waste management in a hospital. *Healthcare* **2024**, *12*, 94. [\[CrossRef\]](#)
42. Cui, L.; Chan, H.K.; Zhou, Y.; Dai, J.; Lim, J.J. Exploring critical factors of green business failure based on Grey-Decision Making Trial and Evaluation Laboratory (DEMATEL). *J. Bus. Res.* **2019**, *98*, 450–461. [\[CrossRef\]](#)
43. Mouloudj, K.; Bouarar, A.C. Investigating predictors of medical students' intentions to engagement in volunteering during the health crisis. *Afr. J. Econ. Manag. Stud.* **2023**, *14*, 205–222. [\[CrossRef\]](#)
44. Yi, G. From green entrepreneurial intentions to green entrepreneurial behaviors: The role of university entrepreneurial support and external institutional support. *Int. Entrep. Manag. J.* **2021**, *17*, 963–979. [\[CrossRef\]](#)
45. Srivastava, M.; Shivani, S.; Dutta, S. Sustainability-oriented entrepreneurial intentions: Work values and the theory of planned behaviour. *J. Small Bus. Enterp. Dev.* **2023**, *ahead-of-print*. [\[CrossRef\]](#)
46. Prabowo, H.; Ikhsan, R.B.; Yuniarty, Y. Drivers of green entrepreneurial intention: Why does sustainability awareness matter among university students? *Front. Psychol.* **2022**, *13*, 873140. [\[CrossRef\]](#) [\[PubMed\]](#)
47. Zhang, S.; Hu, D.; Lin, T.; Li, W.; Zhao, R.; Yang, H.; Pei, Y.; Jiang, L. Determinants affecting residents' waste classification intention and behavior: A study based on TPB and ABC methodology. *J. Environ. Manag.* **2021**, *290*, 112591. [\[CrossRef\]](#) [\[PubMed\]](#)
48. Raimondo, M.; Hamam, M.; D'Amico, M.; Caracciolo, F. Plastic-free behavior of millennials: An application of the theory of planned behavior on drinking choices. *Waste Manag.* **2022**, *138*, 253–261. [\[CrossRef\]](#) [\[PubMed\]](#)
49. Zhang, D.; Huang, G.; Yin, X.; Gong, Q. Residents' waste separation behaviors at the source: Using SEM with the theory of planned behavior in Guangzhou, China. *Int. J. Environ. Res. Public Health* **2015**, *12*, 9475–9491. [\[CrossRef\]](#) [\[PubMed\]](#)
50. Aliedan, M.M.; Elshaer, I.A.; Alyahya, M.A.; Sobaih, A.E.E. Influences of university education support on entrepreneurship orientation and entrepreneurship intention: Application of Theory of Planned Behavior. *Sustainability* **2022**, *14*, 13097. [\[CrossRef\]](#)
51. Aloulou, W.J. Predicting entrepreneurial intentions of final year Saudi university business students by applying the theory of planned behavior. *J. Small Bus. Enterp. Dev.* **2016**, *23*, 1142–1164. [\[CrossRef\]](#)
52. Alshagawi, M.; Ghaleb, M.M. Entrepreneurial intentions of university students in the Kingdom of Saudi Arabia. *Int. J. Innov. Sci.* **2023**, *15*, 581–597. [\[CrossRef\]](#)
53. Botezat, E.-A.; Constăncioară, A.; Dodescu, A.-O.; Pop-Cohuț, I.-C. How stable are students' entrepreneurial intentions in the COVID-19 pandemic context? *Sustainability* **2022**, *14*, 5690. [\[CrossRef\]](#)
54. Waris, I.; Farooq, M.; Hameed, I.; Shahab, A. Promoting sustainable ventures among university students in Pakistan: An empirical study based on the theory of planned behavior. *Horizon* **2021**, *29*, 1–16. [\[CrossRef\]](#)
55. Middermann, L.H.; Kratzer, J.; Perner, S. The impact of environmental risk exposure on the determinants of sustainable entrepreneurship. *Sustainability* **2020**, *12*, 1534. [\[CrossRef\]](#)
56. Sher, A.; Abbas, A.; Mazhar, S.; Azadi, H.; Lin, G. Fostering sustainable ventures: Drivers of sustainable start-up intentions among aspiring entrepreneurs in Pakistan. *J. Clean. Prod.* **2020**, *262*, 121269. [\[CrossRef\]](#)
57. Lopes, J.M.; Suchek, N.; Gomes, S. The antecedents of sustainability-oriented entrepreneurial intentions: An exploratory study of Angolan higher education students. *J. Clean. Prod.* **2023**, *391*, 136236. [\[CrossRef\]](#)
58. Thelken, H.N.; de Jong, G. The impact of values and future orientation on intention formation within sustainable entrepreneurship. *J. Clean. Prod.* **2020**, *266*, 122052. [\[CrossRef\]](#)
59. Yasir, N.; Mahmood, N.; Mehmood, H.S.; Babar, M.; Irfan, M.; Liren, A. Impact of environmental, social values and the consideration of future consequences for the development of a sustainable entrepreneurial intention. *Sustainability* **2021**, *13*, 2648. [\[CrossRef\]](#)
60. Ajzen, I. The theory of planned behavior: Frequently asked questions. *Hum. Behav. Emerg. Tech.* **2020**, *2*, 314–324. [\[CrossRef\]](#)
61. Cai, X.; Hussain, S.; Zhang, Y. Factors that can promote the green entrepreneurial intention of college students: A fuzzy set qualitative comparative analysis. *Front. Psychol.* **2022**, *12*, 776886. [\[CrossRef\]](#)
62. Noor, U.; Rabbani, S.; Dastgeer, G. Impact of job insecurity during COVID-19 on green entrepreneurial intention of Pakistani entrepreneurs: A moderated mediation model. *Kybernetes* **2023**, *52*, 5687–5705. [\[CrossRef\]](#)
63. Bouarar, A.C.; Mouloudj, S.; Umar, T.P.; Mouloudj, K. Antecedents of physicians' intentions to engage in digital volunteering work: An extended technology acceptance model (TAM) approach. *J. Integr. Care* **2023**, *31*, 285–299. [\[CrossRef\]](#)
64. Haque, M.R.; Kour, M. Exploring the growth and future research direction of entrepreneurial self-efficacy in entrepreneurial intention research: A bibliometric analysis. *J. Knowl. Econ.* **2023**. [\[CrossRef\]](#)
65. Elnadi, M.; Gheith, M.H. Entrepreneurial ecosystem, entrepreneurial self-efficacy, and entrepreneurial intention in higher education: Evidence from Saudi Arabia. *Int. J. Manag. Educ.* **2021**, *19*, 100458. [\[CrossRef\]](#)
66. Hsu, D.K.; Burmeister-Lamp, K.; Simmons, S.A.; Foo, M.D.; Hong, M.C.; Pipes, J.D. "I know I can, but I don't fit": Perceived fit, self-efficacy, and entrepreneurial intention. *J. Bus. Ventur.* **2019**, *34*, 311–326. [\[CrossRef\]](#)
67. Al-Azab, M.R.; Zaki, H.S. Towards sustainable development: Antecedents of green entrepreneurship intention among tourism and hospitality students in Egypt. *J. Hosp. Tour. Insights* **2023**, *ahead-of-print*. [\[CrossRef\]](#)

68. Akkajit, P.; Romin, H.; Assawadithalerd, M. Assessment of knowledge, attitude, and practice in respect of medical waste management among healthcare workers in clinics. *J. Environ. Public Health* **2020**, *2020*, 8745472. [\[CrossRef\]](#) [\[PubMed\]](#)
69. Jalal, S.M.; Akhter, F.; Abdelhafez, A.I.; Alrajeh, A.M. Assessment of knowledge, practice and attitude about biomedical waste management among healthcare professionals during COVID-19 crises in Al-Ahsa. *Healthcare* **2021**, *9*, 747. [\[CrossRef\]](#)
70. Papp-Váry, Á.; Pacsi, D.; Szabó, Z. Sustainable aspects of startups among generation Z—Motivations and uncertainties among students in higher educations. *Sustainability* **2023**, *15*, 15676. [\[CrossRef\]](#)
71. Woromogo, S.H.; Djeukang, G.G.; Yagata Moussa, F.E.; Saba Antaon, J.S.; Kort, K.N.; Tebeu, P.M. Assessing knowledge, attitudes, and practices of healthcare workers regarding biomedical waste management at Biyem-Assi District Hospital, Yaounde: A Cross-Sectional Analytical Study. *Adv. Public Health* **2020**, *2020*, 2874064. [\[CrossRef\]](#)
72. Zhang, H.; Liu, J.; Wen, Z.G.; Chen, Y.X. College students' municipal solid waste source separation behavior and its influential factors: A case study in Beijing, China. *J. Clean. Prod.* **2017**, *164*, 444–454. [\[CrossRef\]](#)
73. Wiramihardja, K.; N'dary, V.; Al Mamun, A.; Munikrishnan, U.T.; Yang, Q.; Salamah, A.A.; Hayat, N. Sustainable economic development through entrepreneurship: A study on attitude, opportunity recognition, and entrepreneurial intention among university students in Malaysia. *Front. Psychol.* **2022**, *13*, 866753. [\[CrossRef\]](#) [\[PubMed\]](#)
74. Shabeeb Ali, M.A.; Ammer, M.A.; Elshaer, I.A. Born to be green: Antecedents of green entrepreneurship intentions among higher education students. *Sustainability* **2023**, *15*, 6668. [\[CrossRef\]](#)
75. Agu, A.G. A survey of business and science students' intentions to engage in sustainable entrepreneurship. *Small Enterpr. Res.* **2021**, *28*, 206–227. [\[CrossRef\]](#)
76. Shahzad, M.F.; Khan, K.I.; Saleem, S.; Rashid, T. What factors affect the entrepreneurial intention to start-ups? The role of entrepreneurial skills, propensity to take risks, and innovativeness in open business models. *J. Open Innov. Technol. Mark. Complex.* **2021**, *7*, 173. [\[CrossRef\]](#)
77. Peng, H.; Li, B.; Zhou, C.; Sadowski, B.M. How Does the Appeal of Environmental Values Influence Sustainable Entrepreneurial Intention? *Int. J. Environ. Res. Public Health* **2021**, *18*, 1070. [\[CrossRef\]](#)
78. Galván-Mendoza, O.; González-Rosales, V.M.; Leyva-Hernández, S.N.; Arango-Ramírez, P.M.; Velasco-Aulcy, L. Environmental knowledge, perceived behavioral control, and employee green behavior in female employees of small and medium enterprises in Ensenada, Baja California. *Front. Psychol.* **2022**, *13*, 1082306. [\[CrossRef\]](#)
79. Asimakopoulou, G.; Hernández, V.; Peña Miguel, J. Entrepreneurial intention of engineering students: The role of social norms and entrepreneurial self-efficacy. *Sustainability* **2019**, *11*, 4314. [\[CrossRef\]](#)
80. Guo, J. The significance of green entrepreneurial self-efficacy: Mediating and moderating role of green innovation and green knowledge sharing culture. *Front. Psychol.* **2022**, *13*, 1001867. [\[CrossRef\]](#)
81. Alshebami, A.S. Green innovation, self-efficacy, entrepreneurial orientation and economic performance: Interactions among Saudi small enterprises. *Sustainability* **2023**, *15*, 1961. [\[CrossRef\]](#)
82. Caliendo, M.; Kritikos, A.S.; Rodríguez, D.; Stier, C. Self-efficacy and entrepreneurial performance of start-ups. *Small Bus. Econ.* **2023**, *61*, 1027–1051. [\[CrossRef\]](#)
83. Wang, W.; Cao, Q.; Zhuo, C.; Mou, Y.; Pu, Z.; Zhou, Y. COVID-19 to green entrepreneurial intention: Role of green entrepreneurial self-efficacy, optimism, ecological values, social responsibility, and green entrepreneurial motivation. *Front. Psychol.* **2021**, *12*, 732904. [\[CrossRef\]](#)
84. Jha, N.; Shankar, P.R.; Palaian, S. Knowledge and practice on ecopharmacovigilance and medicine storage amongst medical and dental students in Lalitpur, Nepal. *Risk Manage. Health. Policy* **2021**, *14*, 793–802. [\[CrossRef\]](#) [\[PubMed\]](#)
85. Akhter, S.; Rather, M.I.; Zargar, U.R. Understanding the food waste behaviour in university students: An application of the theory of planned behaviour. *J. Clean. Prod.* **2024**, *437*, 140632. [\[CrossRef\]](#)
86. Qazi, W.; Qureshi, J.A.; Raza, S.A.; Khan, K.A.; Qureshi, M.A. Impact of personality traits and university green entrepreneurial support on students' green entrepreneurial intentions: The moderating role of environmental values. *J. Appl. Res. High. Educ.* **2021**, *13*, 1154–1180. [\[CrossRef\]](#)
87. Jiatong, W.; Murad, M.; Bajun, F.; Tufail, M.S.; Mirza, F. Impact of entrepreneurial education, mindset, and creativity on entrepreneurial intention: Mediating role of entrepreneurial self-efficacy. *Front. Psychol.* **2021**, *12*, 724440. [\[CrossRef\]](#) [\[PubMed\]](#)
88. Mouloudj, K.; Bouarar, A.C.; Mouloudj, S. Extension of the theory of planned behaviour (TPB) to predict farmers' intention to save energy. In *AIP Conference Proceedings*; AIP Publishing LLC: College Park, MD, USA, 2023; Volume 2683, p. 020002. [\[CrossRef\]](#)
89. Liñán, F.; Chen, Y.W. Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrep. Theory Pract.* **2009**, *33*, 593–617. [\[CrossRef\]](#)
90. Henseler, J.; Ringle, C.M.; Sarstedt, M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* **2015**, *43*, 115–135. [\[CrossRef\]](#)
91. Hair, J.F.; Hult, G.T.M.; Ringle, C.; Sarstedt, M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*; Sage Publications: Thousand Oaks, CA, USA, 2013.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.