ORIGINAL ARTICLE

Role of motivation in the return of blood donors: mediating roles of the socio-cognitive variables of the theory of planned behavior

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Abstract

The starting point of this study is based on a ground observation in Tunisia: The unsustainable blood donations and the shortage of clinical blood in some periods of the year (i.e. holidays; covid-19). This observation is also avowed in over the world. The present study extends the theory of planned behavior (TPB) by incorporating relevant variables from Self-determination Theory (SDT). The latter suggests that individuals persist with a behavior when they are internally motivated than externally motivated. Online survey was administrated to assess TPB constructs (attitudes, social norms, perceived behavioral control (PBC), personal moral) and two of SDT factors (autonomous and controlled). 321 donors responded to the questionnaire. Results revealed that effects of autonomous and controlled motivation on behavioral intention were mediated by attitude, PBC as well as moral norms. This paper proposes practical recommendations to social marketing designers to better retain blood donors.

Keywords Blood donation · TPB · Self-determination theory · Behavioral intention

1 Introduction

The field of social marketing research applies to blood donation, given the ability of marketing messages delivered through personalized targeting and communication strategies to contribute to the loyalty of blood donors (Romero-Domínguez et al., 2019; Sundermann et al., 2017). Globally, the rate of return for first-time donors does not exceed 2% (France et al., 2017). Thus, as blood supplies depend on the donors' predisposition, the recruitment and retention of non-remunerated donors represents a daily challenge for blood organizations (Romero-Domínguez

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et al., 2019). However, this reality contradicts with findings in the literature that suggest blood donors have a favorable attitude towards blood donation and are predisposed to return (Huis in 't Veld et al., 2019). Thus, an ongoing wave of social marketing studies is attempting to translate such positive willingness to donate blood into a real behavior and identify practical recommendations (Romero-Domínguez et al., 2019).

Despite the medical and managerial efforts made by transfusion centers and blood banks, research on blood donation is still encouraged and recommended, particularly from the perspective of social marketing (Beerli-Palacio & Martin-Santana, 2015; Sundermann et al., 2017). In Tunisia, the National Center of Blood Transfusion (NCBT) encourages that blood donation remains anonymous, voluntary, and unremunerated. Two main groups are distinguished according to the motives of blood donors. There are who come to donate for a relative or a friend to compensate the stored blood used in a transfusion (replacement or family donors), and there are who come spontaneously without specific emergency and who are not compelled to donate for someone special (volunteer donors). The NCBT (2016) reported that 46,548 of their 145,655 registered donors are volunteer donors. This 31.7% rate of voluntary donation is insufficient, especially during holiday periods. Moreover, only 2 in 50 registered donors have given blood compared to the 8 in 50 members of the population who will require a blood transfusion. Thus, additional research is urgently needed to provide the in-depth knowledge required to design suitable marketing strategies to attract new donors and retain existing blood donors.

The Theory of Planned Behavior (TPB) (Ajzen, 1991) has been widely used to model people's intention to donate blood (France et al., 2014) and has strong predictive value for future behavior. The TPB proposes that attitudes, perceived behavioral control (PBC) and subjective norms positively influence an individual's intention, which in turn is directly related to behavior. Ryan and Deci (2000) proposed another theoretical framework that predicts and explains behaviors, the Self-Determination Theory (SDT), which highlights how different levels of motivation can regulate behavior. Previous studies proposed the TPB should be integrated with the SDT to advance knowledge and better predict behaviors (e.g., Arnautovska et al., 2019; Brooks et al., 2017; Li & Wu, 2018; Williams et al., 2018). France et al. (2017) advocated "this integrative model is based on the premise that the processes proposed by the SDT and TPB regarding motivated behavior are complementary" (p.45). The integrated model has received empirical support, given that the internal and external forms of a person's motivation can influence their levels of perceptions and behavior (France et al., 2014). The integrated version of the TPB and SDT has been applied in several contexts; however, research on blood donation is still lacking and the implications of the TPB and SDT have not been explored in this context (Williams et al., 2018).

Thus, the aim of the current study is to identify the antecedents of blood donors' intention to return to re-donate from an integrated perspective. This research also highlights the role of two specific regulations within the context of blood donation, namely autonomous motivation, and introjected motivation. In the next section, a conceptual framework is developed based on a literature review, then the hypotheses

are derived. The methodology and data collection are provided next, followed by the results section. Finally, we discuss the implications of the results.

2 Conceptual framework and hypotheses

2.1 Theory of planned behavior

The Theory of Planned Behavior (TPB) is a social cognitive theory that suggests attitude, subjective norms (SN) and perceived behavioral control (PBC) are three powerful precursors of a person's intention to produce a behavior (Ajzen, 1991). Attitude refers to "*an individual's positive or negative feelings about performing the target behavior*" (Fishbein & Ajzen, 1975, p. 216). In the context of blood donation, attitude is the favorable or unfavorable feelings towards blood re-donation. Subjective norm refers to the "*perception that most people who really matter to the individual think that he either should or should not perform the behavior in question*" (Fishbein & Ajzen, 1975, p.302). In this respect, a person feeling that people close to them (family, reference group, etc.) appreciate and encourage them to donate blood will increase the probability of their behavior. PBC is "*the reflection of the perceived ease or difficulty involved in performing a behavior*" (Giles et al., 2004; p. 381); specifically, whether the judgment that people make about the decision to donate blood is under their control or not (Giles et al., 2004). Evidence indicates that attitudes, subjective norms and PBC effectively explain an individual's behavioral intentions. Based on the TPB and previous research on blood donation (e.g., Chen, 2017; Charseatd, 2016), we propose the following hypotheses:

H$_1$: Attitude towards blood donation is positively related to donor's intention to re-donate blood.
H$_2$: Subjective norms are positively related to donor's intention to re-donate blood.
H$_3$: PBC is positively related to donor's intention to re-donate blood.

The TPB model allows additional variables to be incorporated in order to explain variation in behavioral intention. A number of studies that applied the TPB in the context of blood donation showed that the variables in the model accounted for between 39 and 73% of the variance in intention to donate blood (Chen, 2017; Wevers et al., 2014). For instance, Giles et al. (2004) found that 73% of the variation in behavioral intention could be explained by the TPB and concluded that the TPB "*worked extremely well*" after adding two additional variables, perceived efficacy and self-identity beliefs-based perception. Moreover, several studies that applied the TPB to predict behavioral intentions and donation behavior suggested other specific variables could be incorporated to enhance the model's predictive ability, such as personal moral norms (personal feeling of responsibility) (Ferguson et al., 2012; France et al., 2008). Beck and Ajzen (1991) observed a positive direct effect between moral norms and behavioral intention. Conner and Armitage (1998) reported that—after the factors in the TPB—moral norms were the most significant

predictor of intentions and increased the prediction of intentions by 4%. Thus, the following additional hypothesis is proposed:

H₄: Personal moral norms positively predict intention to re-donate blood.

2.2 Self-determination theory

The Self-Determination Theory (SDT) is a macro theory of human motivation (Deci et al., 2017) that suggests people are more likely to exhibit sustainable activities when they are more internally than externally motivated (Deci & Ryan, 2000). Deci and Ryan (2000) conceptualized a person's motivation as a multidimensional concept ranging over the continuum from absence of motivation or amotivation (non-self-determined regulation) to intrinsic motivation (self-determined regulation). Extrinsic motivation connects amotivation and intrinsic motivation. The literature highlights two major regulations in particular: autonomous motivation and controlled motivation. These regulations are determined by the degree of autonomy of a person engaging in a specific activity. *Autonomous motivation,* which is often intrinsically motivated, is "*characterized by people being engaged in an activity with a full sense of willingness, volition, and choice*" (Deci et al., 2017, p. 20), whereas, on the *controlled* side, a person behaves according to extrinsic motives such as social pressures, rewards or even self-controlling pressures (i.e., avoiding guilt, ego-involvement) (Deci & Ryan, 2000). According to the SDT, autonomous and controlled regulations are adaptive and maladaptive coping strategies, respectively (Ryan & Deci, 2019). From this perspective, each regulation is related to positive and negative motivational consequences, respectively. Autonomous motivation has been associated with long-term behavior (Arnautovska et al., 2019; France et al., 2017) and positively correlated with behavioral intention (Li & Wu, 2018; Williams et al., 2018). Research investigating the motivation of blood donors suggests that individuals are more likely to persist in this specific activity when they are internally motivated (France et al., 2017). In this respect, autonomous motivation refers to the degree to which an individual seeks to satisfy internal needs (e.g., blood donation makes sense; donating blood for enjoyment) (France et al., 2017). While some studies (e.g., Williams et al., 2018; France et al., 2017) found that autonomous motivation was positively associated with the intention to donate blood, other research indicated that autonomous motivation is related to physical activity (Arnautovska et al., 2019). In contrast, controlled motivation involves a behavior that is regulated by external sociocultural pressures (e.g., avoiding guilt or shame; donating blood for thanks) (France et al., 2017). Li and Wu's (2018) research on volunteerism found that enhancing autonomy and decreasing controlled motivation positively impacted volunteers' intention to stay within an organization. Williams et al. (2018) attempted to assess the effect of motivational orientations on behavioral intention in the context of blood donation, and reported that amotivation, controlled regulation and autonomous motivation directly affected behavioral intention. In contrast, Liao et al. (2017) reported the TPB variables mediated the indirect effect between extrinsic motivation and intention not to use illicit drugs.

2.3 The integrated SDT-TPB model

Recent research attempted to understand the relationship between the TPB and SDT constructs by proposing that the socio-cognitive variables of the TPB mediate the relationship between motivational orientations and behavior (Li & Wu, 2018; Hamilton et al., 2012; Hagger & Chatzisarantis, 2009). In this respect, Arnautovska et al. (2019) found that the relationship between autonomous motivation and the intention behavior was fully mediated by TPB constructs. These results are consistent with previous findings, such as the work of Hamilton et al. (2012) in the context of physical activity and Li and Wu (2018) in the context of voluntarism. In other words, when a person is internally motivated (feels that they are the origin of their decision), they will have a favorable attitude and a feeling of control, which results in higher behavioral intention. Consistent with this logic, several studies in the context of blood donation mentioned that the SDT is essential to identify the quality of an individual's behavior and to predict their motivation to donate blood (as reviewed by France et al., 2017). In fact, when individuals feel that they are the origin of their own decision and feel they are efficient and belong to a larger group that share the same interest, they are more likely to engage in a behavior that will satisfy these needs by adapting their decisions in line with these internal motives (France et al., 2017). Thus, we hypothesize that autonomous motivation has a positive effect on TPB's constructs:

$H_{5.a:}$ Autonomous motivation has a positive effect on attitude.
$H_{5.b:}$ Autonomous motivation has a positive effect on PBC.
$H_{5.c:}$ Autonomous motivation has a positive effect on subjective norms.
$H_{5.d:}$ Autonomous motivation has a positive effect on personal moral norms.

The behavior may also be driven by an externally controlled motivation, such as internal sanction, avoiding guilt and shame (i.e., introjected regulation) (Williams et al., 2018). In fact, introjected regulation represents relatively the first step in the adaptive process of internalization of a behavior (Gillison et al., 2009) which is essential for early stages of a behavior change. Liao et al. (2017) indicated that different types of regulations have a variety of influences on attitudes, social norms and PBC. Indeed, the introjected regulation, which is linked to short-term behavioral persistence, has less effect on TPB variables than autonomous motivation (Li & Wu, 2018). Thus, we posit that controlled motivation will have a positive effect on TPB's constructs:

$H_{6.a:}$ Controlled motivation has a positive effect on attitude.
$H_{6.b:}$ Controlled motivation has a positive effect on PBC.
$H_{6.c:}$ Controlled motivation has a positive effect on social norms.
$H_{6.d:}$ Controlled motivation has a positive effect on personal moral norms.

The literature on SDT argues that external motivation provides various motives for individuals to be involved in specific behaviors. The SDT recognizes that "*most intentional behaviors are multiply motivated*" (Ryan & Deci, 2020, p.3). In particular, external motivation is considered to contribute to the formation of intentions

(Liao et al., 2017). In the case of controlled motivation, the behavior is regulated by the avoidance of shame, guilt, or anxiety (*introjected regulation*), whereas, in the case of autonomous motivation, donors endorse the values of blood donation and make sense of the activity. Although the reasons for and intensity of both of these forms of motivation differ, both autonomous and controlled motivation lead to intentional behaviors. Thus, we hypothesize that:

H_7: Autonomous motivation has a positive effect on behavioral intention to re-donate blood.

H_8: Controlled motivation has a positive effect on behavioral intention to re-donate blood.

3 Research methodology

3.1 Population and sampling

This research assessed Tunisian respondents who had donated blood on at least one occasion and who are eligible to return to donate blood. To ensure that this criterion was fulfilled, one filter question was asked: "Have you ever donated your blood?". An online, self-administered survey was shared on public pages on Facebook, the most commonly used social media platform in Tunisia. A convenience sampling approach was employed. Data collection occurred between October and December, 2019. A total of 347 individuals completed the questionnaire. After deleting invalid surveys (incomplete), we obtained a final sample of 321 respondents. The sociodemographic characteristics of the sample are presented in Table 1.

3.2 Instruments

The original scales are written in English. As our sample consists of non-native English speakers, we translated and back translated the survey. The final survey was administered in both Arabic and French. All instruments were adapted from well-established existing scales. The respondents were invited to indicate their levels of agreement using a Likert scale ranging from "1": strongly disagree to "7": strongly agree. The questions related to attitude, subjective norms, PBC and behavioral intentions were adapted from Giles et al. (2004) and the moral norms scale, from France et al. (2008). The moral norms scale was comprised of three items. The questions related to self-determined motives were adapted for the blood donation context from the instrument designed by France et al. (2014). Autonomous motivation was assessed using integration (e.g., *donating blood is very important to me)* and controlled motivation was measured using introjected regulation items (e.g., *I would feed guilty or ashamed of myself if I did not donate blood*). All responses were scored using seven-point scales (1 = not at all true, 7 = very true).

Table 1 Sociodemographic characteristics of the sample (N = 321)

	Category	N	%
Gender	Female	217	67.6%
	Male	104	32.39%
Age	18–25	169	52.6%
	26–30	45	14%
	30–35	37	11.5%
	36–40	28	8.7%
	41–60	42	13%
Education	Primary education	4	1.2%
	Secondary education	7	2.1%
	Higher university degree	309	96.26%
Past experience during the last 12 months	One time	143	44.5%
	Twice times	82	25.5%
	More than twice	44	13.7%
Syncopal reaction	Yes	75	23%
	No	245	76.6%

4 Results

4.1 Scale refinement

Even though the instruments have been used previously, it was necessary to assess their performance in the Tunisian context. IBM SPSS Amos 26 was used to conduct principal component analyses (CPA) and confirmatory factor analyses (CFA). Orthogonal Varimax Rotation was performed for all instruments. The Cronbach's alpha values for each scale were satisfactory. CFA with maximum likelihood estimation was employed as the second stage of scale validation. These analyses were conducted to refine the factor structure and also assess the psychometric properties of the instruments, as such reliability, convergent and discriminant validity. The CFA showed that a total of 24 of the original 29 items could be maintained for further analyses. As indicated in Table 2, the average variance extracted (AVE) for each construct exceeded 0.5 (Fornell & Larcker, 1981). Overall, the convergent validity of the proposed constructs of the measurement model were adequate. Table 2 displays detailed results.

4.2 Hypotheses testing

Path analysis was conducted using AMOS 0.26 software to estimate mediation effects (direct and indirect links). The hypothesized model was specified through seven variables measured using the manifest indicators described in the scale

Table 2 Scales' descriptive statistics and measurement properties after purification

Items	Factor loading	CR	AVE
Attitude towards blood donation: For me, donating blood within the next 8 weeks would be		0.75	0.63
unpleasant/pleasant	0.77		
useless/useful	0.68		
the wrong thing to do/the right thing to do	0.66		
pointless/worthwhile	0.67		
Subjective Norms		0.84	0.72
Most people who are important to me think that I should donate blood	0.73		
The people who influence my decisions think that I should donate blood	0.82		
My friends acknowledge my blood donation	0.70		
Most people who are important to me will give blood in the next 8 weeks	0.68		
Perceived Behavioral Control		0.738	0.62
I believe I am able to donate blood	0.83		
Most people who are important to me think that I should donate blood	0.88		
It is mostly up to me whether or not I give blood next three months	0.72		
Moral Norm		0.82	0.71
I feel a moral obligation to give blood	0.78		
I feel personally responsible to give blood	0.77		
It is a social obligation to give blood	0.68		
Introjected regulation: I want to give blood Because..		0.84	0.69
I would feed guilty or ashamed of myself if I did not donate blood	0.68		
I would feel bad about myself if I did not donate blood	0.95		
I would regret it if I did not donate blood	0.93		
Autonomous motivation		0.86	0.74
Blood donation is an important thing to do	0.85		
I have carefully thought about it and believe donating blood is very important for many aspects of my life	0.88		
Donating blood is an important choice I really want to make	0.87		
For me, being a blood donor means more than just donating blood	0.80		
Intention		0.91	0.83
I will try to donate blood when I will be eligible again	0.776		
I have decided to donate again	0.802		
I intend to donate blood	0.803		

CR Composite Reliability, *AVE* average variance extracted

refinement section. The hypothesized model had an adequate fit to the data (x^2/df $= 1.89$, CFI $= 0.998$, TLI $= 0.983$, RMSEA $= 0.047$).

The results indicated that intention to re-donate blood was significantly associated with attitude ($\beta = 0.20$, $p < 1\%$), moral norms ($\beta = 0.13$, $p < 5\%$) and PBC ($\beta = 0.25$, $p < 1\%$), thus H_1, H_2 and H_4 were supported. However, no significant relationship

was observed between intention to re-donate blood and subjective norms (p=0.6), thus H_3 was rejected.

Consistent with H_5, autonomous motivation positively predicted attitudes (β=0.385), subjective norms (β=0.348), moral norms (β=0.454) and PBC (β=0.283; all $p<1\%$). H_{6b} and H_{6d} were supported, as controlled motivation was positively related to moral norms (β=0.27; $p<1\%$) and PBC (β=0.16, $p<5\%$). However, controlled motivation had no association with attitude (β=0.03; $p=0.51$) or subjective norms (β=-0.06, $p=0.32$), thus H_{6a} and H_{6c} were rejected.

We used an indirect bootstrapping method (Preacher & Hayes, 2008) to test H_7 and H_8. Indirect bootstrapping with a resampling of 1000 (via a 90% bias-corrected CI procedure) indicated significant indirect effects existed, as the 0 value was not straddled (Preacher & Hayes, 2008), suggesting the existence of mediation between the SDT and TPB constructs (Table 3). Finally, the direct paths from controlled motivation to intention and from autonomous motivation to intention were not significant (rejecting H7 and H8), leading to a preference for the full meditational model (Fig. 1). The results shown in Table 3 indicate that attitude, moral behavior and PBC fully mediate the relationship between autonomous motivation and intention. Moreover, PBC and personal moral norms fully mediate the relationship between controlled motivation and intention.

5 Discussion

5.1 Theoretical implications

This research conflicts with previous studies that supported integration of the SDT and TPB (Arnautovska et al., 2019; Williams et al., 2018). We propose an integrated model that explains the effects of autonomous and controlled motivation, as well as the cognitive variables of the TPB, for the health behavior of re-donation among blood donors. By specifying the significant effects of this model, we propose three contributions to our knowledge of this health behavior.

Firstly, this work provides some support of previous research on belief-based determinants of behavioral intention. By showing that the SDT is fully mediated by social-cognitive factors, our findings provide some support of previous research on belief-based determinants of behavioral intention (Hamilton et al., 2012; Li & Wu, 2018; Liao et al., 2017).

Likewise, integration of the SDT explained an additional 8.6% of the variance in donor's intention to re-donate blood compared to the TPB-only model. Specifically, our results show that attitudes, personal moral norms and/or PBC fully mediated the relationship between the two forms of motivation (autonomous/controlled) and intention to re-donate blood. In practice, this suggests that enhancing autonomous motivation and decreasing controlled motivation will indirectly enhance blood donors' intention to re-donate. This finding corroborates the work of Hagger and Chatzisarantis (2009), who showed that individuals' attitudes and perception of control within the health behavior context are consistent with the SDT. In other words, individuals who are autonomously motivated are more likely to have a favorable

Table 3 Results for multiple mediation model for blood re-donation intention

Independent Variable (IV)	(dependent variable) (DV)	Mediating variables (M)	Effect of IV on M	Effect of M on DV	Total effect	Direct effect	Indirect effect	95% bootstrap CI LL	UL
Autonomous motivation	Intention to re-donate blood	Attitude	0.45*	0.21	0.84	0.56	0.12	0.028	0.135
		SN	0.33*	-0.08(n.s)			-	-0.040	0.018
		PMN	0.45*	0.14			0.06	0.016	0.122
		PBC	0.33*	0.25			0.02	0.002	0.062
Controlled Motivation		Attitude	0.06 (n.s)				-	-0.012	0.25
		SN	-0.05 (n.s)				-	-0.005	0.19
		PMN	0.27*				0.04	0.012	0.077
		PBC	0.16**				0.04	0.016	0.075

ATT attitude, *SN* social norms, *PMN* personal moral norms, *PBC* perceived behavioral control, *INT* behavioral intention, *CI* bootstrapping confidence interval
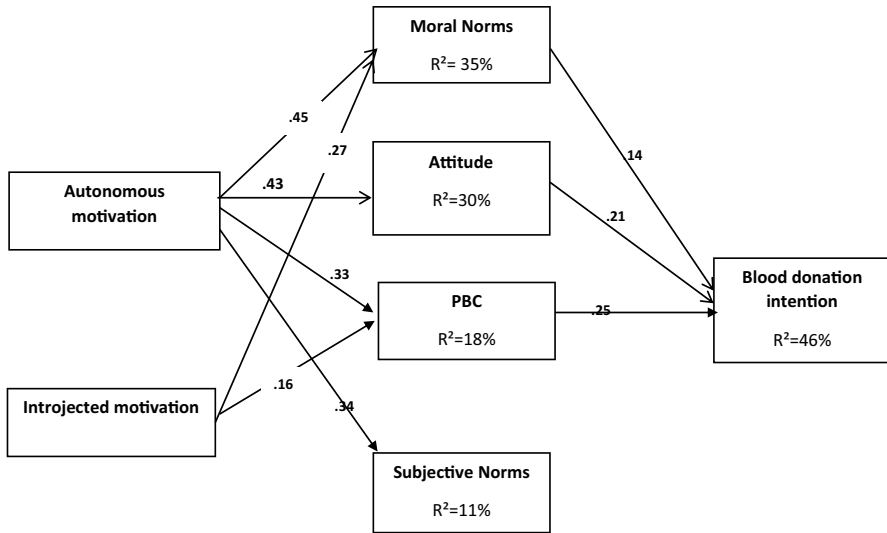
*$p < 1\%$; **$p < 5\%$

Fig. 1 Path analysis to predict blood donors' intention to return

attitude toward re-donating blood, because they feel they have control and feel they are responsible for donating blood. This finding is also in agreement with Costa et al. (2020) and Arnautovska et al. (2019).

Secondly, in support of H_5, the model indicated that autonomous motivation positively predicts attitudes, moral norms and PBC, as well as subjective norms. These results corroborate previous studies within different contexts (e.g., Arnautovska et al., 2019; Williams et al., 2018), and highlight the importance of considering autonomous cognition when developing blood donation models. Specifically, a blood donor's autonomous motivation positively predicts their belief-based perception. Autonomously motivated blood donors perceive blood donation as an important task (attitudes) that represents a social responsibility (moral norms), which is concretely controllable (PBC), and socially acceptable and appreciated (subjective norms). On the other hand, we observed introjected motivation significantly affected both moral norms and PBC. As expected, these effects ($\beta = 0.16$ to 0.27) were weaker than the effects of autonomous motivation ($\beta = 0.454$ to 0.283). Moreover, introjected motivation had no association with subjective norms and attitudes. These findings corroborate previous studies (i.e., Li & Wu, 2018; Ryan & Deci, 2000) and suggest that controlled motivation should have a small effect (or even no effect) on these perceptions compared to the effect of autonomous motivation. One possible explanation for this result is that autonomous regulation is considered a fundamental determinant of adaptive motivational outcomes (Ryan & Deci, 2000).

Finally, our finding that attitudes, PBC and personal moral norms are positive predictors of the intention to donate blood again provide some support for previous research of belief-based determinants of behavioral intention (e.g., France et al., 2014). However, in disagreement with previous studies in the context of blood donation (i.e., Williams et al., 2018; Chen, 2017; Charseatd, 2016), subjective norms

did not have a significant effect on intention in our model. This discrepancy could be explained by the fact that the predictive accuracy of intention may vary according across different contexts and behaviors (Ajzen, 1991) and evidence that—in some contexts—subjective norms have smaller (Downs & Hausenblas, 2005; Williams et al., 2018) or non-significant (Costa et al., 2020; Li & Wu, 2018) effects compared to attitudes and PBC. In the current research, PBC was the strongest predictor of intention to re-donate blood among the attitudes and personal moral norms, which corroborates early research (France et al., 2014).

5.2 Managerial implications

Based on this study, a number of operational issues that may emerge when developing interventions and social communication strategies can be proposed. Blood donation centers may consider using this theoretical framework to consider the predisposition of existing blood donors, and to encourage them to return through retention programs. Strengthening motivation can retain blood donors (France et al., 2017; Frye et al., 2018), which can directly shape donors' attitudes, personal moral norms and PBC. For example, it is possible to encourage donors by involving them in recruitment of their peers and by helping donors to recognize the value of donating blood (autonomous motivation). Controlled motivation can be achieved through sending reminders (Sundermann et al., 2017) or by designing a marketing communication campaign that highlights self-esteem rewards or ego-involvement. Moreover, the results obtained by applying the TPB in this specific sample of donors provide evidence that attitude, PBC and moral norms are related to the intention to re-donate blood, through the approval of others (subjective norms) is not. This indicates that personal beliefs and self-perceptions matter the most to this sample of donors. Once again, this study suggests that practical social marketing appeals to blood donors should highlight the value of positively improving social behavior.

5.3 Limitations and future research

Although the results of this study contribute to research on blood donation behavior in Tunisia, many limitations should be noted. First, the respondents were recruited through a convenience sampling approach, thus the distribution of characteristics (i.e., education, gender) may not reflect the actual blood donor population. It would be advantageous to acquire a quota sample to reduce sampling errors. Moreover, all respondents were Tunisian nationals; thus, the results cannot be generalized to other populations or fields of research.

Secondly, this research did not consider the demographic characteristics of the respondents (such as gender and education) or their experiences with blood donation (e.g., syncopal reactions), which may be an interesting direction of research. Finally, to the best of our knowledge, this research is the first to apply the extended integrated model to the context of blood donation in Tunisia and provides a starting point for additional research to improve the re-donation rate among existing blood donors.

Declarations

Conflict of interest The author reported no potential conflict of interest.

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