

**HIGINO FERNANDO NEVES ESTEVES**

**COMMITMENT, SEXUAL SATISFACTION AND  
RELATIONAL SATISFACTION DURING MILITARY  
DEPLOYMENT:  
A COMPARATIVE STUDY**

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**Escola de Psicologia e Ciências da Vida**

**Lisboa**

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Dissertação defendida em provas públicas para obtenção do Grau de Mestre em Sexologia - especialidade em Sexualidade Humana, no Curso de Mestrado Transdisciplinar em Sexologia, conferido pela Universidade Lusófona de Humanidades e Tecnologias, no dia 27 de outubro de 2022 perante o júri nomeado pelo seguinte Despacho Reitoral nº 234/2022, com a seguinte composição:

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**Escola de Psicologia e Ciências da Vida**

**Lisboa**

**2022**

*I don't feel that it is necessary to know exactly what I am. The main interest in life and work is to become someone else that you were not in the beginning.*

*Michel Foucault*

*This study is dedicated to the Portuguese Soldiers who see fraternity in other Peoples and, from the cultural differences, build equality and peace.*

## Abstract

Current literature studying Long Distance Relationship (LDR) originated by military deployment is mainly focused on at home partner's perspective and the associations between geographical separation and relational satisfaction. Little is known about the role that commitment and sexual satisfaction play in the relationship and the perspective of the deployed military members in comparison with those living a relationship based on a daily contact with their partners. **Objective:** The main purpose of this cross-sectional and comparative study was to compare diverse relational variables, such as commitment, relational satisfaction and sexual satisfaction between Portuguese military members in military deployment, i.e., experiencing a Long Distance Relationship (LDR) and those who maintained a Geographically Close Relationship (GCR). **Design and Method:** Participants in Long Distance Relationships (n=172) were Portuguese military members deployed in Afghanistan (n=72), Central-African Republic (n=86) and São Tomé and Príncipe (n=15). The ones that were in a GCR (n=256) were also Portuguese military members, but on normal duty in different Military Units and Bases in the Portuguese Territory. All voluntary participants were in a romantic relationship and completed an online survey, that included the Investment Model Scale (Rodrigues & Lopes, 2013), the New Sexual Satisfaction Scale (Pechorro et al., 2014) and items assessing Communication satisfaction, previously used in exploratory studies with Portuguese military members and their partners. LDR and GCR data was collected simultaneously, three months after deployment. Bivariate correlations were used to analyze the associations between variables, independent samples T-test was applied to compare the samples according the variables of interest, and simple and sequential mediations were performed to check for the predicted models. **Results:** The findings suggest that the military members in LDR had significantly higher levels of commitment, relational and sexual satisfaction than those in GCR. No differences were found in the degree of relational investment. Additionally, communicational satisfaction and relational satisfaction were identified as significant indirect mediators of the relationship between the group (LDR vs GCR) and commitment and the group (LDR vs GCR) and sexual satisfaction. **Conclusions:** Overall, the results are in line with previous research that evidenced an increased overall satisfaction with various relational factors when partners are living a Long Distance Relationship. **Keywords:** Commitment; sexual satisfaction; relational satisfaction; communication; military deployment; long distance relationships.

## Acknowledgment

*To my academic advisor:*

Professor Ana Filipa Beato, with immense gratitude for your competence, guidance, patience and support. This was a long and fruitful journey of constant learning. Your rigor as a scientific researcher, along with your extraordinary human qualities, are aspects that I will always carry with me in my professional work in the future.

*To my academic co-advisor:*

Professor Renato Pessoa dos Santos, from whom, as a result of our talks, from the distant year of 2012 to the present, I have had the privilege of obtaining many lessons that provided crucial information and motivation for this study. Your friendship, your wise military and academic advice were extremely significant for this achievement. Thank you, Sir!

*To Professor Pedro Rosa*

Thank you for your expertise in statistical analysis, as well as your criticisms, corrections and mentoring in searching for higher demanding standards and scientific rigor for this study.

*To members of the Portuguese Armed Forces*

My gratitude for your availability, generosity and sense of duty, which resulted in such a significant involvement in this study. I am proud of our Portuguese Soldiers!

*To His Excellency the Portuguese Chief of Defense, Admiral António Silva Ribeiro,*

Sir, I am very grateful for allowing me to produce this dissertation with such stimulating and motivational leadership that offered the involvement of the service branch commands and, in practical terms, the participation of the members of the Portuguese military in an operational environment.

*To the Directors and Professionals of the Army Centre of Applied Psychology*

I am grateful for the supportive working environment and their committed efforts, especially in a moment with changes occurring within insecure scenarios. You always found a solution for every problem. Thank you for your permanent proactivity, positivity and optimism.

*To my SOF Brothers*

You have been my inspiration since my first mission in 2008. Resilience, purpose, sense of mission and brotherhood have allowed me to do this with the strength that characterizes Special Operations Forces. Thank you Army and Navy SOF brothers.

*To my Friend João Pascoal*

Once again our journeys crossed and once again you were my wise counselor. More than knowledge, you have, and you are willing to share wisdom. Grateful my old friend.

*To my colleagues Márcia, Sandra and Sofia*

*You are people who inspire. We are people who motivate each other, putting into action our ideals of a Society with acceptance of pleasure as a fundamental component of education and sexual health. Thank you for the fantastic journey we are taking together.*

*To my loved Herika*

I know it hasn't been easy for you to walk by my side over the years. The international missions, my irreverence, the changes... and the postponed trips! New York, Rome and London waiting for us! But, despite everything, your love, our love!

*To my loved Mariah*

“Dad, did you ever stop studying?” Much more than dad and daughter, we are adventurers looking for opportunities to learn. Thanks, power girl, for reminding me what really matters and thanks for the skill you have to stop time, when I think there isn't any. I am immensely grateful to walk along this path with you.

*To my loved Joana, Miguel, Gino and Izabelle*

Distant or not, you are part of my support. I am deeply grateful to my daughters and sons for believing that what I do is important and for being an unconditional source of love and understanding at all times. I am immensely proud and grateful for the incredible human beings you are.

*To my Mom (in memoriam)*

Thank you, mom, for believing and teaching me that love can overcome anything. Eternally grateful for making me more sensitive, stronger and aware than I ever could be without your love and maternal affection.

## Acronyms and Abbreviations

$\alpha$  - Cronbach's alpha

$\beta$  - Regression coefficient

% - Percentage

AAPC - Army Applied Psychology Centre

AFG – Afghanistan

BCa - Bias-corrected and accelerated

CAR - Central-African Republic

C - Commitment

CI - Confidence interval

CS - Communicational satisfaction

ECoDM - Emotional Cycle of Deployment Model

DV - Dependent variable

e.g. - For the sake of example (Latin: “exemplary gratia”)

et al. - And other contributors (Latin: “et alia”)

etc. - And others of the same type (Latin: “et cetera”)

EU - European Union

FtF - Face to Face

GCR - Geographically Close Relationship

Gr - Group

H - Hypothesis

i.e. - In other words (Latin: “id est”)

ICT - Information and Communication Technology

IM - Investment Model

IMM - International Military Mission

IMS - Investment Model Scale

IP - Internet Protocol (address)

IS - Investment size

IV - Independent variable

LDR - Long Distance Relationship

LL - Lower limit

M - Mean (or average)

Max - Maximum value of value range

Min. - Minimum value of value range

N - Total number of cases

n - Number of subsamples

NATO - North Atlantic Treaty Organization

NSSS - New Sexual Satisfaction Scale

p - Probability associated with the test value (p-value)

PAF - Portuguese Armed Forces

PRT - Portugal (or portuguese)

QA - Quality of alternatives

RQ - Research Question

RS - Relational satisfaction

SD - Standard deviation

SE - Standard error

SPSS - Statistical Package for the Social Sciences

SS - Sexual satisfaction

STP - San Tome and Principe

TO - Theatre of Operations

UL - Upper limit

UN - United Nations

URL - Uniform Resource Locator

WHO - World Health Organization

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## **INTRODUCTION**

Military deployments in International Military Missions (IMM) are a frequent reality for the Portuguese (PRT) military members. Actually, since 1996, Portugal (PRT) has a permanent average of approximately 600 military members deployed in peace keeping and humanitarian international missions, namely from United Nations (UN), European Union (EU), North Atlantic Treaty Organization (NATO) and bilateral cooperation with some Countries. Over the past 24 years, Portuguese military members participated in IMM in several countries such as Afghanistan, Bosnia, Central-African Republic, East Timor, Iraq, Kosovo, Lebanon, Lithuania, among others, and some multinational maritime operations e.g. in Mediterranean and Atlantic (Sousa, 2011). Six months is the most common duration of military deployment in the Portuguese Armed Forces (PAF). There are three phases in an IMM: pre-deployment, deployment and post-deployment. Pre-deployment is the period to train and prepare individuals and the Forces and normally represents a period of six months. Post-deployment takes an average of a month and includes logistic affairs, evaluations, debriefings, report of lessons identified, closing ceremony and vacations. Currently the psychological evaluation and support to the military individuals is conducted by the Army Applied Psychology Centre (AAPC) and includes interventions in the three phases.

Studies investigating Military member's perceptions and outcomes in Long Distance Relationships (LDR) still scarce (Barbudo, et al, 2014). Thus, it is relevant to explore the impact of being deployed from the romantic partner and a possible path to conduct these investigations is by comparing military members in LDR to those in common Geographically Close Relationships (GCR) (Hooge, 2012).

Despite the increasing number of researches on post deployment adjustment of military couples, gaps remain on studies focused on the period of the deployment (Merolla, 2010), i.e., the period of geographical separation. More specifically, questions persist to better clarify the implications of couple communication, during deployment, for the military members themselves, on their commitment, sexual satisfaction and relational satisfaction and.

### **Long Distance Relationships**

Romantic relationships can be defined as intimate relationships in which there is a perception of proximity, parity, equity and common sharing of personal information, as well as the presence of sexual interactions or, in sum, romantic relationships are characterized by a dimension of affective sharing combined with a sexual dimension. Romantic relationships permit to fill the gaps on membership needs and to establish close and intimate relationships

with other people to avoid loneliness and physical closeness and can be considered normal characteristic of romantic relationships (Stafford, 2005).

However, romantic partners can face physical separation due to several reasons, e.g. educational goals in a distant university, career opportunities at the company's branch in another city or even in another country, and experience a LDR, i.e, those relationships in which partners expect to maintain a closeness, but communication and physical contact is limited due to geographical distance. As the literature has not established a standard definition, different criteria have been used to define LDR. Since this study is focus on LDR due to military deployment, two criteria were used: (1) Relationship partners had to live in different countries; (2) The physical separation occurs for minimum consecutive period of three months. (Knobloch, et al., 2016).

In a LDR, separated couples usually face the strains of interacting from afar and the need to maintain relationship commitment (Maguire, et al., 2013). For the military couples, extended periods of physical separations (i.e. three months or more), are hurdles to face in their relationships (Pincus et al., 2001) and these military deployments can have important consequences for military couples throughout each stage of the process (Knobloch, et al., 2016). Due to the insecure scenarios and individual responsibilities of the deployed military member, these LDR have specific characteristics which makes them different from other LDR. Military members must execute the tasks and responsibilities of their mission while also staying connected with family members (McCarroll, et al., 2005; McNulty, 2005), while at-home partners face the challenge to establish new routines, run the household and care for children independently, while maintaining their relationship with the deployed partner (Lapp et al., 2010; Lara-Cinisomo et al., 2012). In other words, at-home partner assumes a “sole commander” and subjacent tasks and responsibilities, which were previously shared (Bóia, et al., 2017).

Regardless of the variety of stressors that accompany deployments in insecure countries, many military members report that home-front issues are their biggest stressor while deployed (Greene, et al., 2010) and, on the other side, geographic separation may lead at-home partners to use different behaviors, such as emotional distancing, adopting independent attitude, keeping emotions to themselves once they live in denial (Cafferky & Shi, 2015).

Nevertheless, the literature hints that military deployment can bring some positive consequences for couples. It can represent an opportunity for individual growth and for positive changes in romantic and family relationships (Easterbrooks, et al., 2013). A study that explored

perceptions of military spouses of PRT Military members are consistent with those findings, showing that, during the deployment stage, fewer conflicts occurred and reported higher intimacy and closeness with their romantic partners, especially in terms of empathy, sharing affection and emotional support (Bóia et al., 2017).

Also in a study utilizing a sample of unmarried students and workers between 18 and 35 years old, individuals in LDR reported higher scores of relationship satisfaction, as well as lower levels of problematic communication compared to those in GCR (Gretchen, et al., 2012).

### **Communication in LDR**

The importance of couples' communication is vastly studied (Byers, 2005), in a longitudinal research investigating relationship satisfaction and sexual satisfaction of individuals in long-term relationships, pointed out that poor communication results in a decrease in relational satisfaction and in sexual satisfaction. In the opposite direction good communicators had reported increases in satisfaction in both variables, which suggests that poor communication leads to decreased satisfaction in different areas of the relationship, including sexual satisfaction and overall satisfaction with the relationship (Byers, 2005).

However, communication might be affected by geographic distance, creating uncertainty about the relationship and its maintenance (Stafford, 2010). One of the most important differences between LDR and GCR is that in LDR partners are not able to see each other face-to-face (FtF) on a daily basis (Stafford & Merolla, 2007) which can represent a big challenge compared to a conventional GCR. Therefore, communication is an important factor in trying to maintain a relationship during separations (Carter & Renshaw, 2015) which might obligate LDR partners to compensate geographical distance by improving their communication (Mietzner & Lin, 2005).

While some authors argue that online communication increases the emotional distance between individuals and their families (e.g., Coyne et al. 2012; Padilla-Walker et al. 2012), others consider that it promotes interpersonal closeness (e.g., Brenner 2013; Chalmers 2011),

The disruption of interdependent interactions between both partners and physical separation can generate the experience of missing a partner, which can lead to a motivational relationship-enhancing behavior and communication should be used to maintain the well-being of the relationship (Le et al, 2010). Communication might be delivered in many ways (e.g. via phone, video calls, cards, packs, email, chats) allowing LDR partners to maintain closeness despite the physical separation (Pistole, 2010). Instant accessibility of the information and

communication technologies (ICTs) and their increasing user-friendly characteristics made online communication a powerful tool for communication (Rea, et al., 2015).

During the months of military deployment, couples' communication is of crucial importance (Carter & Renshaw, 2016a). Research on communication during deployment have privileged the frequency of the exchanges between LDR couples as its central predictor and relationship well-being as its focal outcome. Nonetheless, the frequency and channel of communication available to the military member, depend in part on the security requirements of the mission (Hinojosa et al., 2012). Thus, conflicting research's results exist (Greene et al., 2010). Some studies found that at-home partners who have more frequent communication with the military partners were less satisfied with their relationship (Joseph & Afifi, 2010), while others reported that military members who communicated with their partners every day during deployment were more satisfied with their relationship than those who communicated with their spouse less than once per week (Ponder & Aguirre, 2012).

Qualitative exploratory study with Portuguese couples, of which at least one of the partners was a military member, emphasizes that frequent communication between the couple can reduce isolation and uncertainties, can help to sustain conjugal rituals, and can facilitate family interactions, maintaining or strengthening the relationship, even at an intimate level (Barbudo et al., 2014). It means that communication allows the military service member to feel present and intimately involved in his family's daily life and in decision-making (Barbudo et al., 2014). Authors states that communication is the coping strategy most referenced by participating couples to mitigate the effects of physical distance, through the sharing of daily experiences and plans after return home. Further it was also emphasized that delayed communication (e.g., letter and mail packs) was associated with more pleasure and satisfaction, which is in line other studies (e.g., Carter et al., 2015). Another study suggests the importance of communication as a strategy used by couples, during the military mission, with the internet being the most scored response, followed by telephone and mail (Martins et al., 2014).

The exponential technology development during the last two decades allows military members to use ICTs and social media networks from the almost all Theatre of Operations (TO), keeping in contact with partners, extended family and friends (Bóia et al., 2017). Communication between LDR partners can reduce apprehension, facilitate support, and mitigate worry during deployment (Carter et al., 2015). In fact, PRT military members and their partners reported that internet is a valuable resource on facilitating phone and video calls. These

communication resources created the interesting phenomenon of maintaining a psychological and emotional presence during the physical absence (Bóia et al., 2017).

So, communication in LDR plays an important role which can influence other variables, such as commitment, sexual satisfaction and relational satisfaction.

### **Commitment and relational satisfaction in LDR**

A growing number of studies that compared LDR with GCR has found that, on average, the relationship stability, satisfaction, and trust reported by couples in LDR are equal to or better than those reported by couples in GCR (Gretchen, et al., 2012; Stafford, 2010). Furthermore, LDR partners tend to avoid conflict, express affection, sidestep distress and show positive attitude to at home partner (Joseph & Afifi, 2010).

Relationship satisfaction includes the positive and the negative characteristics of the relationship related to the individual expectation and costs, evaluating past relationship experiences and comparing of other couple's relationships. Commitment is impacted, among other dimensions, by the relational satisfaction, being greater when the outcome is more positive for this dimension (Rusbult et al., 1998).

The Investment Model (IM) was developed based on the learning theories of rewards and costs (Rusbult, 1980, 1983) and tried to describe how individuals maintain and support their romantic relationship and the reasons for others to decide to leave their current relationship (Rodrigues & Lopes, 2013). One of the main aims of research dedicated to romantic relationships is related to the factors that lead individual decision making to maintain or abandon them and their association with the level of commitment. This is the central question of Rusbult's Investment Model, which is valid for both heterosexual and homosexual romantic relationships (Rodrigues, et al., 2011). According to his rationale, the behaviors intended to maintain or to quit from a relationship, are associated with the level of commitment toward the partner and the romantic relationship itself. Specifically, commitment reflects the individual's "intent to persist in a relationship, including long-term orientation toward involvement, as well as feelings of psychological attachment" (Rusbult, et al., 2006, p. 618). Attachment to the partner, a long-term plan for the relationship and the intention to support the relationship, are the three main components of commitment (Arriaga & Agnew, 2001).

The IM postulates that an individual will be more committed when experiencing more satisfaction with the partner and the relationship; when perceiving less quality and less interest in alternative partners or situations; and when both partners are doing higher investment in the relationship (Rodrigues & Lopes, 2013). Thus, commitment is a result of the level of

satisfaction, the perception of quality among alternatives, and the investment on the relationship (Rusbult et al., 1998).

Relational satisfaction depends on the perception of positive affect and attraction in regards to the partner, and achievement of relational needs (e.g., intimacy). Alternatives are, normally, external of the relationship and assume relevance since they have higher quality to fulfil internal needs and are not being covered with the present partner and/or relationship. The investment refers to the expedient and dedication to the relationship, e.g., time shared, assets acquired together, disclosure of fantasies (Rodrigues & Lopes, 2013).

In LDR the relationship's maintenance is related to commitment, which is associated with missing the romantic partner (Le et al, 2010). Previous studies demonstrated that IM is a reliable model to predict the commitment and the decision to stay or to abandon a romantic relationship (Le & Agnew, 2003). However, few studies have explored this model in LDR, which have specific features and characteristics, already described.

To implement the theoretical dimensions of the IM, Rusbult and colleagues (1998) developed the Investment Model Scale (IMS). This scale, that operationalizes the IM, was adapted and validated for the Portuguese population (Rodrigues & Lopes, 2013) and is used in the current study.

Additionally, there is scarcity of research exploring sexual satisfaction in military population, which can be investigated by relating it to the dimensions of the IM.

### **Sexual satisfaction in LDR**

Sexuality is an integral part of most romantic relationships (Sprecher et al., 2006). Considering sexuality an important component of romantic relationships (Byers, 2005), sexual satisfaction can be seen as an indicator of sexual health, which is strongly associated to relational satisfaction (Pascoal, et al., 2013).

Studies demonstrate that in the context of romantic relationships, sexual satisfaction is highly related to relational satisfaction (Christopher & Sprecher, 2000). Sexual satisfaction is defined by Lawrance and Byers (1995) as “an affective response arising from one’s subjective evaluation of the positive and negative dimensions associated with one’s sexual relationship” (p. 268). Interplay between sexual satisfaction and relationship satisfaction are related in both directions (Sprecher, 2002) or even (not totally consistent with that), sexual satisfaction predicts subsequent relationship satisfaction for both men and women (Fallis et al, 2016). Individuals who report being sexually satisfied also report almost six times more likelihood of relational happiness, and individuals who are sexually satisfied report more than twice the likelihood of

relational happiness, which indicates a high interdependence of sexual satisfaction and relational satisfaction (Fisher et al, 2014).

Despite the geographical distance, it must be assumed that sexuality is present in a LDR and the absence of physical contact cannot be presumed as a minor important relationship component. Many studies indicated no difference in sexual satisfaction between couples in LDR and those in GCR (Goldsmith & Byers, 2018a; Kelmer et al., 2013) and one possible reason is already disclosed in recent research: because of sexual challenges originated by physical separation, individuals in LDR adopt sexual maintenance behaviors with more frequency than individuals experiencing a common GCR (Goldsmith & Byers, 2018b). Previous findings suggest greater sexual satisfaction directly related with more frequency of sexual activity (Peplau, et al., 2004).

When geographically separated, individuals have the possibility to engage in online sexual activity with their partners, which can serve as a dyadic maintenance strategy (Goldsmith & Byers, 2018a). Two sexual maintenance behaviors are proposed in that study: sexual idealization of the partner and sexual fantasies about the partner. As in romantic idealization, sexual idealization presupposes having a positive unrealistic view of the sexual relationship and of the sexual attributes and performance of the partner (Goldsmith & Byers, 2018a). Sexual fantasies involving partners have been associated with positive feelings about sexual relationship and increased sexual arousal (Moyano, et al., 2016), which may suggest that there is a reinforcement of maintenance of relationship when there are more sexual fantasies involving the partner and less about non-partners (Goldsmith & Byers, 2018b).

Overall, the importance of time and distance apart remains unclear, and perhaps other factors underlie the quality of LDR (Dargie, et al., 2015). Even with limited interaction, there is evidence that LDR partners frequently show greater relational stability than partners in GCR (Stafford & Merolla, 2007). Factors, possibly consistent with those conclusions, are the findings of Goldsmith & Byers (2018b). Results indicated that partners in LDR engage more frequently in some sexual maintenance behaviors than individuals in GCRs. Plus, adopting the practice of solitary sexual activities (e.g., masturbation, viewing pornography, reading erotic stories, etc.) also might serve as a sexual maintenance behavior since, even in an individual and solitary way, individuals meet their sexual needs in the absence of the partner, or when the partner is not available (different schedules, availability of a place with privacy, lack of interest, etc.) and not looking for alternatives outside the relationship (Goldsmith & Byers, 2018b).

In a subsequent study, the results indicated how relationship satisfaction was supported by connectivity, by nurturing the romantic relationship in a positive way and by engaging in mutually rewarding sexual activities with the partner, regardless of whether the individual is in an LDR or in a GCR. Thus, the way in which relationship behaviors and sexual maintenance affect satisfaction was very similar between individuals in LDRs and in GCR (Goldsmith & Byers, 2020).

### **Objectives of the present study**

The main purpose of this study was to compare diverse relational variables between a group of Portuguese military members in a LDR and a group that maintain a GCR. Consequently, based on investment model framework (Rusbult, 1998), we developed several specific objectives to test their fit to people in LDR:

- a) Analyze if there were differences in relational variables, i.e., relational satisfaction, investment, quality of alternatives and commitment between the LDR and GCR groups.
- b) Analyze if there were differences in communicational satisfaction among groups.
- c) Analyze if there were differences in sexual satisfaction among groups.
- d) Explore if relational satisfaction mediates the relation between the group (i.e., being in a LDR) and commitment.
- e) Explore if investment mediate the relation between the group (i.e., being in a LDR) and commitment.
- f) Explore if the qualities of alternatives mediate the relation between the group (i.e., being in a LDR) and commitment.
- g) Explore if the communicational satisfaction and the relational satisfaction sequentially mediates the relation between the group (i.e., being in a LDR) and commitment.
- h) Explore if the communicational satisfaction and the relational satisfaction sequentially mediates the relation between the group (i.e., being in a LDR) and sexual satisfaction.

Some studies indicated stability on the relationship among military couples during the deployment period. However, previous research during deployment were focus on the at home partner. Consequently, it was adequate to innovate accessing the mechanisms, characteristics and individual military members' perceptions about couples' communications and possible correlations with commitment, sexual satisfaction and relational satisfaction. Outcome knowledge, integrated with previous and future research can be a tool in helping military

members and their partners by offering recommendations for improving their well-being when facing a LDR.

Investment Model (Rusbult, 1980, 1983) served to examine commitment, relational satisfaction, perception of quality of alternatives, and the investment size on the relationship in deployed and non-deployed military members.

The first step of our quantitative study was the review of literature to deepen the framing of the variables of partners' communication, relational satisfaction and sexual satisfaction; then the data from 428 PRT military service members was accounted; and, finally, the study was concluded by examining the implications of the results, aiming to understand possible correlations between those variables for the military members internationally deployed and non-deployed.

Despite the increasing literature investigating the key role of communication during deployment (Carter & Renshaw, 2016a), a gap remains about how it mediates relational satisfaction, commitment and sexual satisfaction in military members. On the other hand, there is scarcity of research exploring sexual satisfaction in military population, even more evident in investigating their perceptions (and not the common at-home partners report) during the international military deployments. Additionally, as far as we know, this is the first research that includes military members' perceptions, reports and outcomes collected during the deployment stage itself, which can be a valuable contribution to better understand military personnel behaviors in LDR versus GCR. In this context, it is expected that the results replicate and extend outcomes from previous exploratory researches conducted with PRT military members and partners. On the other hand, findings are expected to deliver insight into what improve relational satisfaction, investment, commitment and sexual satisfaction in military members and to inform and advise practice and behaviors on how to improve individual and couple's empowerment and well-being.

Based on literature that highlighted the potential positive outcome of LDR (e.g. Goldsmith & Byers, 2018a; Gretchen, et al., 2012; Joseph & Afifi, 2010; Moyano, et al., 2016; Stafford, 2010) and the possible contribution of communication increment during deployment (e.g. Bóia et al., 2017; Carter & Renshaw, 2015; Pistole, 2010), six hypotheses were designed:

Hypothesis 1 (H1): LDR military members present higher levels of commitment than those in GCR.

Hypothesis 2 (H2): LDR military members present higher levels of relational satisfaction than those in GCR.

Hypothesis 3 (H3): LDR military members will present higher levels of sexual satisfaction than those in GCR.

Hypothesis 4 (H4): Relational satisfaction, investment and the quality of alternatives will mediate the relation between the group (i.e., being in a LDR) and commitment.

Hypothesis 5 (H5): Communicational satisfaction with and relational satisfaction will sequentially mediate the relation between group (i.e., being in a LDR) and commitment.

Hypothesis 6 (H6): Communicational satisfaction with and relational satisfaction will sequentially mediate the relation between group (i.e., being in a LDR) and sexual satisfaction.

## **METHODS**

## **Participants**

The sample included in the study consists of 428 military members (n = 398 men and n = 30 women), their mean age was 34.38 (SD = .78) and ranged from 18 to 57 years old. Volunteer participants were members of the Portuguese Armed Forces (Navy, Army and Air Force) and were organized in two groups: group one include 172 participants (n = 160 men and n = 12 women) experiencing a Long Distance Relationship (LDR), representing military members deployed in international missions; and group two included 256 participants (n = 238 men and n = 18 women) in a Geographically Close Relationship (GCR), representing military members serving at Military Units and Bases in Portuguese territory and having a daily basis physical contact with their partners.

Sample characteristics are described in the Table 1.

**Table 1**

*Sociodemographic characteristics of the Participants (N = 428)*

<b>Age</b>	<b>LDR (n = 172)</b>		<b>GCR (n = 256)</b>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
18-29	122	70.9	98	38.3
30-44	39	22.7	86	33.6
45-57	11	6.4	72	28.1

<b>Education</b>	<b>LDR (n = 172)</b>		<b>GCR (n = 256)</b>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Incomplete high school	13	7.6	13	5.3
High school	135	78.5	167	65.2
University degree	6	3.5	27	10.5
MSc	18	10.5	47	18.4
PhD	0	0.0	2	0.8

<b>Residence</b>	<b>LDR (n = 172)</b>		<b>GCR (n = 256)</b>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Urban	111	64.5	183	71.5
Rural	61	35.5	73	28.5

<b>Service branches</b>	<b>LDR (n = 172)</b>		<b>GCR (n = 256)</b>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Navy	16	9.3	33	12.9
Army	156	90.7	211	82.4
Air Force	0	0.0	12	4.7

<b>Sexual orientation</b>	<b>LDR (n = 172)</b>		<b>GCR (n = 256)</b>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Heterosexual	166	96.5	246	96.0
Bisexual	1	0.6	5	2.0
Homosexual	3	1.7	5	2.0
Other	2	1.2	0	0.0

<b>Living with</b>	LDR (n = 172)		GCR (n = 256)	
	<i>n</i>	%	<i>n</i>	%
Alone	9	5.2	13	5.1
Parents	72	41.9	63	24.6
Partner	37	21.5	43	16.8
Partner & others	13	7.6	31	12.1
Partner & Child(ren)	39	22.7	102	39.8
Sharing home w/friends	0	0.0	2	0.8
Other	2	1.2	2	0.8

<b>Relationship status</b>	LDR (n = 172)		GCR (n = 256)	
	<i>n</i>	%	<i>n</i>	%
Married & cohabiting	40	23.8	102	39.8
Married non-cohabiting	1	0.6	0	0.0
Cohabiting	49	28.5	73	28.5
Exclusive dating	82	47.7	81	31.6

<b>Relationship duration</b>	LDR (n = 172)		GCR (n = 256)	
	<i>n</i>	%	<i>n</i>	%
3 months-1 year	18	10.5	45	17.6
1-7 years	103	59.9	87	34.0
7-20 years	47	27.3	96	37.5
> 20 years	4	2.3	28	10.9

## Instruments

**General Introduction Questionnaire.** Sociodemographic questionnaire was designed to collect information about sociodemographic and other relevant information, such as service branches, age, gender, education level, area and region of residence, relationship status, sexual orientation, number of sexual partners, frequency of sexual activity, etc.

**Communication Behaviors Questionnaire.** A questionnaire used in two exploratory studies with Portuguese military members and their partners (Barbudo et al., 2014; Bóia et al., 2017) to assess the communication behaviors that partners engage in while separated (LDR) and while in GCR. Five items probed the contents and frequency of communication: *Daily military activity vs work-home; Children; Relationship; Extended family; Intimacy; Sexual life; Plans for the future*. The classification items range from 1 = *We don't talk* to 5 = *Always*. The total score is obtained by adding all items. The higher the values on the scale score, the higher the levels of frequency of communication. Cronbach's  $\alpha$  was 0.71. And another questionnaire to assess the emotional valence of contact / communication. Three positive items (1 point each): *Increase wellbeing; Increase relationship satisfaction; Increase sexual satisfaction* and three negative items (1 point each): *Increase anxiety; Decrease relationship satisfaction; Decrease sexual satisfaction*. The score is obtained by adding the scores of positive items minus negative items. Cronbach's  $\alpha$  was 0.63. The higher the values on the scale score, the higher the emotional valence of contact / communication. Global Cronbach's  $\alpha$  was 0.71.

**New Sexual Satisfaction Scale (Stulhofer et al., 2010; Portuguese validation of NSSS, Pechorro, P. et al., 2015),** is a bidimensional 20 item scale, consisting of a subscale centered on the individual (items 1-10; e.g., item 1- "*The intensity of my sexual arousal*"). Cronbach's  $\alpha$  was 0.96. And a subscale centered on the partner and sexual activity (items 11-20; e.g., item 18- "*My partner's sexual availability*"). Cronbach's  $\alpha$  was 0.97. The classification items are ordinal of 5 points (from 1 = *Not Satisfied* to 5 = *Totally Satisfied*). The scores for each dimension are obtained by adding the scores of the individual items in that dimension and the total NSSS score is obtained by adding the scores of all items. The higher the values on the scale score, the higher the levels of sexual satisfaction. The Portuguese version used, presents an adequate level of internal consistency (Cronbach's  $\alpha = 0.94$ ) with good psychometric properties (validity and reliability) were confirmed for this study with a Cronbach's  $\alpha = 0.98$ ).

**Investment Model Scale – Short version (IMS, original scale, Rusbult et al, 1998; Rodrigues & Lopes, 2013)** is a 22-item scale with a four-dimensional factorial structure, consisting of a subscale of the "*Satisfaction*" (items 1-5; e.g., item 4- "*Our relationship makes me very happy*"). Cronbach's  $\alpha = 0.90$ ; a subscale of the "*Quality of Alternatives*" (items 6-10;

e.g., item 8- "*If I weren't dating my partner, I would do fine - I would find another appealing person to date*"). Cronbach's  $\alpha = 0.87$ ; a subscale of the "*Investment*" (items 11-15; e.g., item 15- "*Compared to other people I know, I have invested a great deal in my relationship with my partner*"). Cronbach's  $\alpha = 0.87$ ; and a last subscale of the "*Commitment*" (items 16-22; e.g., item 17- "*I am committed to maintaining my relationship with my partner*"). Cronbach's  $\alpha = 0.67$ . The ranking items are ordinals of 7 points (from 1 = *Strongly disagree* to 7 = *Strongly agree*). The scores for each dimension are obtained by adding the scores for the individual items in that dimension. IMS can be used by both women and men of any orientation and type of dyadic relationship. The authors (Rusbult et al., 1998) demonstrated in their model that "Satisfaction", "Quality of alternatives" and "Investment" predict the level of "Commitment". A higher level of relational "Commitment" results from a high score on the "Satisfaction" dimension, a low score on the "Quality of alternatives" dimension and a high score on the "Investment" dimension. The Portuguese version of IMS has demonstrated good psychometric properties in terms of validity and reliability. In the present study global Cronbach's  $\alpha$  was 0.83.

## **Procedures**

This study was approved by the Chief of Defense of Portugal and by the Scientific Research Ethics and Deontology Commission of the Psychology and Life Sciences School of Universidade Lusófona. Recruitment of military participants was facilitated by the Navy, Army and Air Force Commands and had a close cooperation from the Army Applied Psychology Centre. Participants in LDR were recruited among the Portuguese Contingents in International Missions, after the third month of deployment in Afghanistan (AFG) (n = 71), in Central-African Republic (CAR) (n = 86) and in San-Tome and Principe (STP) (n = 15). Volunteers participants in GCR were recruited among military personnel serving at several Military Bases and Barracks in Portuguese territory. LDR and GCR data were collected online from middle March to middle April 2020, through a secure computer platform hosted on the Army Applied Psychology Centre, which was only accessed by the authors. To participate in this study, it was mandatory to be a military member of the Portuguese Armed Forces and to be in a romantic relationship for, at least, three months before deployment. The response of questionnaire was preceded by the informed consent that participants had to read and agree, and by consistent information about voluntary participation, absence of monetary or other compensation, the possibility to quit the survey at any time, fully and strictly anonymity and confidentiality.

Participants deployed in International Missions, i.e. LDR, were briefed and recruited at the military compounds in AFG, CAR and STP. To qualify for the LDR group, military participants were required to meet the following criteria: (1) be deployed in an international military mission of at least three months, (2) be in committed relationship of at least three months before the deployment. Since a total of 404 military personnel were deployed, at that time, at the three Countries, the response rate was 42.57% (n = 172). Participants in GCR were briefed and recruited at several Military Bases and Barracks in Portuguese Territory. Inclusion criteria for GCR was: (1) not being deployed in an international mission in the last 6 months, (2) be in committed relationship of at least three months, (3) be able to be with their partners in person (face-to-face) in a daily basis. LDR and GCR volunteer participants accessed an information letter and the questionnaires through a URL. Since the questionnaires address various issues considered intimate, in order to assure that participants responded with confidence and sincerity, it was strictly guaranteed the anonymity of all responses without identifying participants neither the IPs or geolocation of the used electronic devices. Twenty-one more participants were discarded: 15 who did not complete the survey and six answered negatively the question to confirm a currently romantic relationship.

### Statistical Analysis

G-Power software, version 3.1.9.2 (<https://www.psychologie.hhu.de>) was performed in order to calculate *a priori* statistically required sample size for this study. Highest input parameters were defined for the T-test of means and standard deviation. The computerized calculation indicated the need to have a total sample of 220 participants, with a minimum of 88 in LDR group and 132 in GCR group.

Results are displayed at figure 1.

### Figure 1

*A priori statistically required sample size using G-Power software, version 3.1.9.2.*

<i>G*Power 3.1.9.2.</i>		
<b>t tests - Means: Difference between two independent means (two groups)</b>		
<b>Analysis:</b>	A priori: Compute required sample size	
<b>Input:</b>	Tail(s)	= Two
	Effect size d	= 0.5
	$\alpha$ err prob	= 0.05
	Power (1- $\beta$ err prob)	= 0.95
	Allocation ratio N2/N1	= 1.5
<b>Output:</b>	Noncentrality parameter $\delta$	= 3.6331804
	Critical t	= 1.9709056
	Df	= 218
	Sample size group 1	= 88
	Sample size group 2	= 132
	Total sample size	= 220
	Actual power	= 0.9512569

Note: A priori statistically required sample size using G-Power software, version 3.1.9.2.

IBM Statistic Program for Social Sciences (SPSS), version 26 for Windows and Process Macro version 4.0 for SPSS, were used to perform data and statistical analysis. Study variables were normally distributed which allowed the use of parametric methods. First, the variables of interest were characterized by test central tendency (mean) and dispersion (SD and Amplitude). Subsequently, the bivariate Pearson correlation coefficient was performed, to analyze the correlations between the dependent variables, namely, relational satisfaction, sexual satisfaction, quality of alternatives, investment size, commitment and communicational satisfaction. Posteriorly, comparative statistics was conducted by using Independent Samples T-test, for the purpose to test the effect from Group (independent variable) over the mentioned dependent variables (DV). As Investment Model Scale was one of the relevant instruments used in our study, it was performed a simple mediation aiming to investigate if and how each of the variables (model dimensions) mediate the effect of group on commitment. This phase was initiated by testing Investment Model correlations with our data to verify if commitment

increased because of the effect of each construct. The role of communicational satisfaction was, also, added to the model. Since the investment size showed no significant difference in the T-test, this variable was not included in final analyses. Afterwards sequential mediations were performed using the Process Macro version 4.0 for SPSS, model 4, for the simple mediations and model 6 for the sequential mediations (Hayes, 2018) to measure the effect of the independent variable (group) and the effect of other mediator variables over the commitment and over the sexual satisfaction (outcome variables). By using this procedure, it was possible to identify each mediator indirect effect. Moreover, using model 6 of Process, the statistical significance of the mediating variable was investigated by Bias-corrected and accelerated (BCa) with confidence interval being estimated by Bootstrapping technique (5000, re-sampling). This method generated 95% confidence intervals (CI) of the indirect effects. Bootstrapped 95% CIs not straddling zero were considered statistically significant.

## **RESULTS**

### **Descriptive and comparative statistics**

By comparing the results from the group in LDR versus group in GCR, which were obtained from descriptive statistics and the independent samples T-test, it was found a significant variance in all dependent variables, excepted for investment size ( $p > .05$ ). Actually, Military members in a LDR showed higher scores for commitment, relational satisfaction, sexual satisfaction, communicational satisfaction and, according to Investment Model, a lower score for quality of alternatives than those living a GCR.

Results are displayed in Table 2.

**Table 2**

*Descriptive Statistics (Mean and Standard Deviations) and Independent Samples T-test for LDR and GCR groups.*

	LDR (n = 172)		GCR (n = 256)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
SS	81.69	16.55	77.37	15.22	2.77	.006*
RS	30.17	4.65	27.74	5.65	4.69	.000*
QA	15.09	7.52	18.02	7.06	-4.10	.000*
IS	19.80	7.09	21.02	7.31	-1.72	.086
C	61.84	15.95	55.95	18.23	3.44	.001*
CS	2.36	.83	1.64	1.14	7.13	.000*

*Notes.* **SS**: sexual satisfaction; **RS**: relational satisfaction; **QA**: quality of alternatives; **IS**: investment size; **C**: commitment; **CS**: communicational satisfaction.

\* $p < .05$ .

### Correlations between dependent variables in LDR and in GCR

Analyzing the correlations between the six dependent variables in group of LDR it was showed that sexual satisfaction was positively and significantly correlated with relational satisfaction and communicational satisfaction; relational satisfaction was positively and significantly correlated with commitment and communicational satisfaction; quality of alternatives, was negatively and significantly correlated with commitment; investment size was positively and significantly correlated with commitment; and, finally, commitment was positively and significantly correlated with communicational satisfaction.

These intercorrelations among the dependent variables indicate the probability of support for the hypothetical indirect effects.

Results are displayed in Table 3.

**Table 3**

*Correlations between the six variables: sexual satisfaction; relational satisfaction; quality of alternatives; investment size; commitment; communicational satisfaction, for the group in LDR (n = 172).*

LDR	(n = 172)		1	2	3	4	5	6
	M	SD						
1. SS	81.69	16.55						
2. RS	30.17	4.65	.21**					
3. QA	15.09	7.52	.01	-.13				
4. IS	19.80	7.09	-.12	.13	.13			
5. C	61.84	15.95	.08	.65***	-.61***	.45**		
6. CS	2.36	0.83	.24**	.26***	-.08	.03	.22**	

*Notes.* SS: sexual satisfaction; RS: relational satisfaction; QA: quality of alternatives; IS: investment size; C: commitment; CS: communicational satisfaction.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Correlations values between dependent variables in the group of GCR indicated that Sexual satisfaction was positively and significantly correlated with relational satisfaction, commitment and communicational satisfaction, relational satisfaction was positively and significantly correlated with investment size, commitment and communicational satisfaction, quality of alternatives, was positively and significantly correlated with investment size and negatively and significantly correlated with commitment, investment size was positively and significantly correlated with commitment and communicational satisfaction. Finally, commitment was positively and significantly correlated with communicational satisfaction.

Results are displayed in Table 4.

**Table 4**

*Correlations between the six variables: sexual satisfaction; relational satisfaction; quality of alternatives; investment size; commitment; communicational satisfaction, for the group in GCR (n = 256).*

GCR	(n = 256)		1	2	3	4	5	6
	M	SD						
1. SS	77.37	15.22						
2. RS	27.74	5.65	.60***					
3. QA	18.02	7.06	.01	-.07				
4. IS	21.02	7.31	.10	.31***	.18**			
5. C	55.95	18.23	.39***	.75***	-.46***	.56***		
6. CS	1.64	1.14	.15*	.22**	.06	.17**	.19**	

*Notes.* **SS**: sexual satisfaction; **RS**: relational satisfaction; **QA**: quality of alternatives; **IS**: investment size; **C**: commitment; **CS**: communicational satisfaction.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

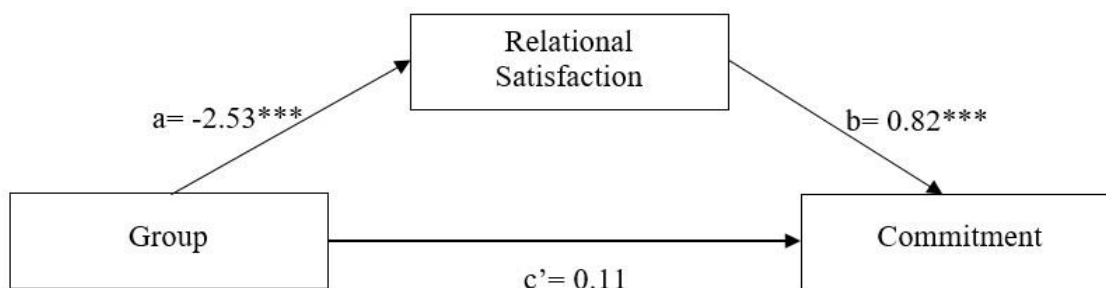
### Simple mediational analysis

The first simple mediation performed to investigate the Group as a predictor of commitment, demonstrated that the group was not direct significant predictor of commitment ( $b = 0.11, p > .001$  and a zero included in CI). However, IV effect on DV occurred indirectly through the influence of the mediator relational satisfaction ( $b = -2.07, p < .001$ ).

This simple mediation model is displayed in Figure 2 and the results in the Table 5.

**Figure 2**

*Simple mediation model with the group as a predictor of commitment, mediated by relational satisfaction.*



*Note:* This figures demonstrates the simple mediation model with the Group as a predictor of commitment, mediated by relational satisfaction.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; a, b= indirect effect; c'= direct effect; c= total effect.

**Table 5**

*Simple Mediation Analysis: Path coefficients and significances.*

Pathways	Coefficients <i>b</i>	SE	95% CI		<i>p</i>
			LL	UL	
a (indirect effect: Gr > RS)	-2.53	0.56	-3.63	-1.43	<.001
b (indirect effect: RS > C)	-0.82	0.04	.73	.91	<.001
c' (direct effect Gr > C)	0.11	0.53	-0.93	1.15	.830

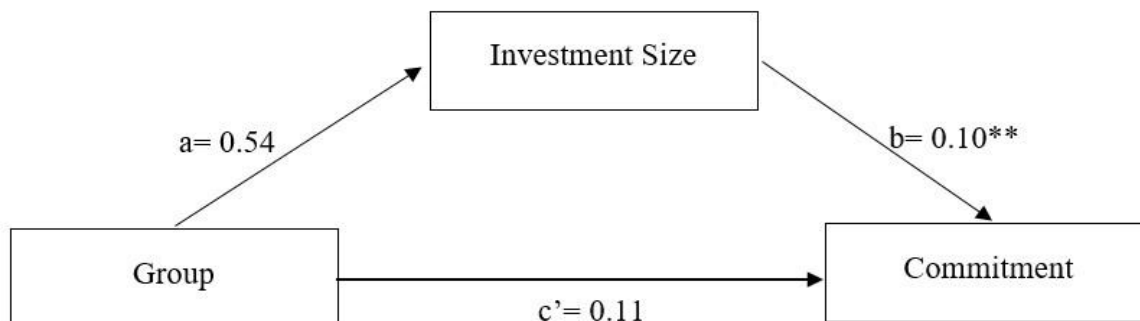
*Note.* Gr = group; RS = relational satisfaction; C = commitment; b = unstandardized coefficients; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit;  $p$ =value.

Secondly, another simple mediation was performed to investigate if IV effect on DV occurred indirectly through the influence of the mediator investment size. Results showed that was not supported ( $p > .001$  and a zero included in CI).

This simple mediation model is displayed in Figure 3 and the results in the Table 6.

**Figure 3**

Simple mediation model with the group as a predictor of commitment, mediated by investment size.



Note: Simple mediation model with the group as a predictor of commitment, mediated by investment size. \* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; a, b= indirect effect; c'= direct effect; c= total effect.

**Table 6**

Simple Mediation Analysis: Path coefficients and significances.

Pathways	Coefficients <i>b</i>	SE	95% CI		<i>p</i>
			LL	UL	
a (indirect effect: Gr > IS)	0.54	0.75	-0.93	2.00	.470
b (indirect effect: IS > C)	0.10	0.03	0.03	0.17	.003
c' (direct effect Gr > C)	0.11	0.53	-0.93	1.15	.830

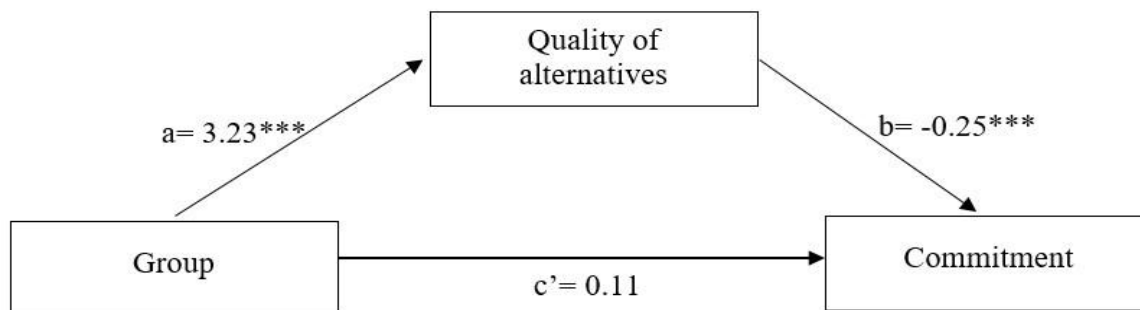
Note. Gr = group; IS = investment size; C = commitment; b = unstandardized coefficients; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit;  $p$ =value.

One last simple mediation was performed to investigate if IV effect on DV occurred indirectly through the influence of the mediator quality of alternatives. As already showed group was not direct significant predictor of commitment ( $b = 0.11, p > .001$  and a zero included in CI) and its effect on this dependent variable occurred indirectly through the influence of the mediator quality of alternatives ( $b = -0.81, p < .001$ )

This simple mediation model is displayed in Figure 4 and the results in the Table 7.

**Figure 4**

*Simple mediation model with the group as a predictor of commitment, mediated by quality of alternatives.*



*Note:* Simple mediation model with the group as a predictor of commitment, mediated by quality of alternatives. \* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; a, b= indirect effect; c'= direct effect; c= total effect.

**Table 7**

*Simple Mediation Analysis: Path coefficients and significances.*

Pathways	Coefficients <i>b</i>	SE	95% CI		<i>p</i>
			LL	UL	
a (indirect effect: Gr > QA)	3.23	0.76	1.74	4.73	<.001
b (indirect effect: QA > C)	-0.25	0.03	-0.32	-0.19	<.001
c' (direct effect Gr > C)	0.11	0.53	-0.93	1.15	.830

*Note.* Gr = group; QA = quality of alternatives; C = commitment; b = unstandardized coefficients; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit;  $p$ =value.

### Sequential mediational analysis

Since the results of the simple mediation demonstrated that group was not direct significant predictor of commitment, a sequential mediation was performed following this indirect effect key:

group > communicational satisfaction > commitment;

group > relational satisfaction > commitment;

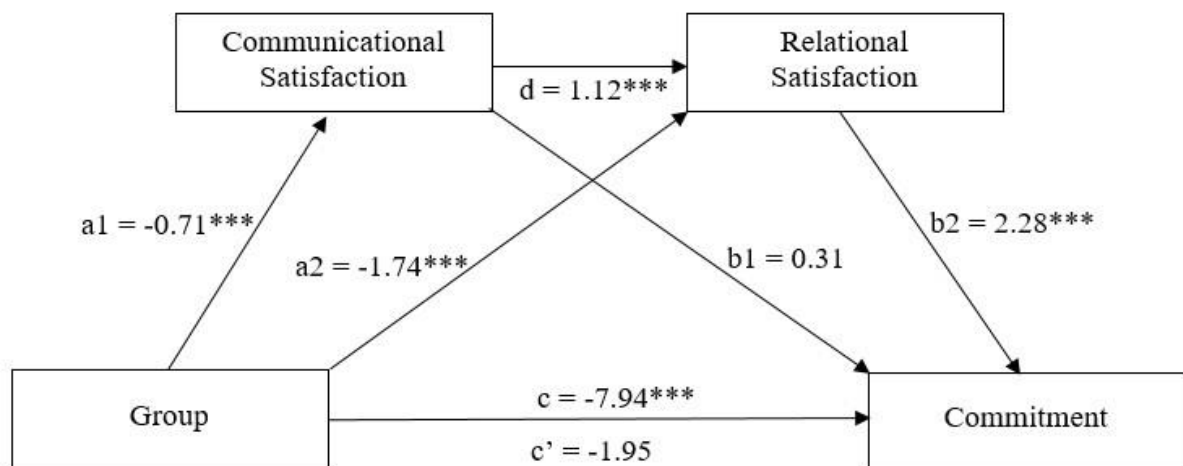
group > communicational satisfaction > relational satisfaction > commitment.

As theorized, results showed that the IV effect on DV was sequentially mediated by communicational satisfaction and relational satisfaction, as the indirect pathways of the effect were significant ( $b = -0.60, p < .001$ ). Actually, these pathways fully accounted for the overall impact of group on commitment with a significant total effect ( $b = -7.94, p < .001$ ) and once the direct effect was insignificant ( $p > .05$ ).

This sequential mediation model is displayed in Figure 5 and the results in the Table 8.

**Figure 5**

*Sequential mediation model with the group as a predictor of commitment, sequentially mediated by communicational satisfaction and by relational satisfaction*



*Note:* Sequential mediation model with the group as a predictor of commitment, mediated sequentially by communicational satisfaction and by relational satisfaction.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; a, a1, b, b1, d= indirect effect; c'= direct effect; c= total effect.

**Table 8**

*Sequential Mediation Analysis: Path coefficients and significances.*

Pathways	Coefficients <i>b</i>	SE	95% CI		<i>p</i>
			LL	UL	
a1 (indirect effect: Gr > CS)	-0.71	0.11	-0.92	-0.49	<.001
a2 (indirect effect: Gr > RS)	-1.74	0.58	-2.87	-0.60	<.001
b1 (indirect effect: CS > C)	0.31	0.56	-0.79	. 1.41	.580
b2 (indirect effect: RS > C)	2.28	0.11	2.07	2.50	<.001
d (indirect effect: CS > RS)	1.12	0.25	0.64	1.61	<.001
c' (direct effect Gr > C)	-1.95	1.30	-4.49	0.60	.133
c (total effect Gr > C)	-7.94	1.77	-11.43	-4.45	<.001

*Note.* Gr = group; RS = relational satisfaction; C = commitment; *b* = unstandardized coefficients; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; *p*=value.

Lastly another sequential mediation was performed to investigate the group as a predictor of sexual satisfaction, following this indirect effect key:

group > communicational satisfaction > sexual satisfaction;

group > relational satisfaction > sexual satisfaction;

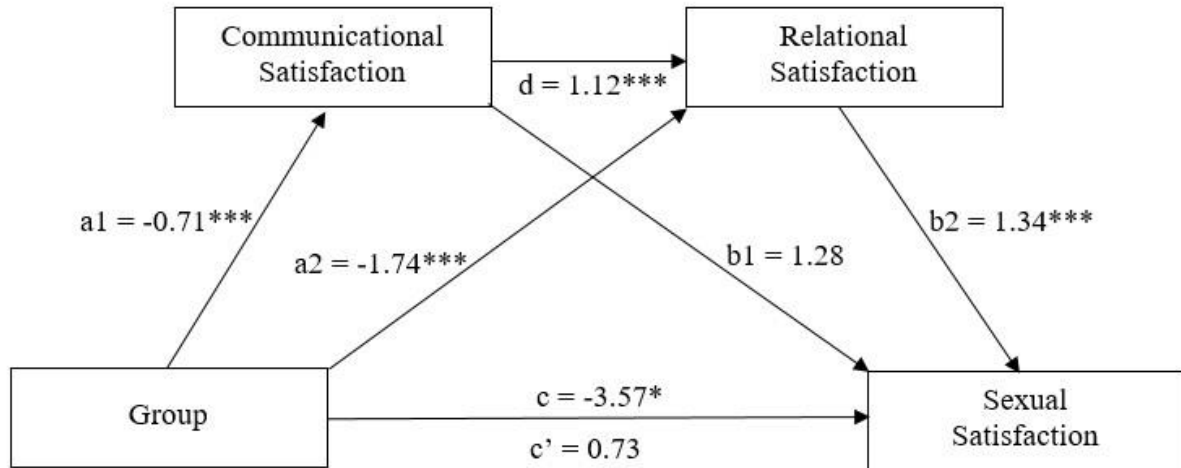
group > communicational satisfaction > relational satisfaction > sexual satisfaction.

Results demonstrated that the direct effect of group on sexual satisfaction was not significant ( $b = -1.95, p > .001$  and a zero included in CI). The indirect effect of communicational satisfaction also was not significant ( $b = -0.91, p > .001$  and a zero included in CI). However, the indirect effect of relational satisfaction was significant ( $b = -2.33, p < .001$ ). Additionally, following the path (a1, d, b2) it was showed significant sequential indirect effect of the two mediational variables ( $p < .001$ ) and with significant total effect on DV ( $b = -3.57, p < .05$ ).

The sequential mediation model is displayed in Figure 6 and the results in the Table 9.

**Figure 6**

*Sequential mediation model with the group as a predictor of sexual satisfaction, sequentially mediated by communicational satisfaction and by relational satisfaction*



*Note:* Sequential mediation model with the group as a predictor of sexual satisfaction mediated successively by communicational satisfaction and by relational satisfaction.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; a, a1, b, b1, d= indirect effect; c'= direct effect; c= total effect.

**Table 9**

*Sequential Mediation Analysis: Path coefficients and significances*

Pathways	Coefficients <i>b</i>	SE	95% CI		<i>p</i>
			LL	UL	
a1 (indirect effect: Gr > CS)	-0.71	0.11	-0.92	-0.49	<.001
a2 (indirect effect: Gr > RS)	-1.74	0.58	-2.87	-0.60	<.001
b1 (indirect effect: CS > SS)	1.28	0.68	-0.06	2.61	.060
b2 (indirect effect: RS > SS)	1.34	0.13	1.08	1.60	<.001
d (indirect effect: CS > RS)	1.12	0.25	0.64	1.61	<.001
c' (direct effect Gr > SS)	0.73	1.57	-2.35	3.81	.642
c (total effect Gr > SS)	-3.57	1.67	-6.86	-0.28	.034

*Note.* Gr = group; RS = relational satisfaction; SS = sexual satisfaction; b = unstandardized coefficients; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; *p*=value.

## **DISCUSSION**

The present study aimed to compare diverse relational factors between a group of Portuguese military service members in a Long Distance Relationship (LDR) and a group that maintain a Geographically Close Relationship (GCR). By testing variables relational satisfaction, investment size, quality of alternatives and commitment it was expected to replicate the investment model framework (Rusbult, 1998), in the group in LDR. Nevertheless, sexual satisfaction and communicational satisfaction were also tested to fulfill the mentioned objectives in study.

LDR group showed higher significant results than GCR group, for all the variables, except for investment size, which showed no statistically significant difference. As a result of the analysis, hypothesis 1 (LDR service members present higher levels of commitment than those in GCR) was confirmed. As IM postulate (Rusbult et al., 1998), individuals are more committed when they experience more satisfaction with the partner and the relationship; when perceiving less quality and less interest in alternative partners or situations (Rodrigues & Lopes, 2013). The LDR military members presented higher levels of relational satisfaction than those in GCR, confirming the second hypothesis of the study. This finding is also aligned with IM (Rusbult et al., 1998) and other previous studies, e.g., Goldsmith & Byers (2018a), Gretchen, et al. (2012), Joseph & Afifi (2010), Moyano, et al. (2016), which has compared LDR with GCR and suggested that the relationship stability and satisfaction reported by individual in LDR are equal to or better than those reported by individuals in GCR (Stafford, 2010). Relational satisfaction can also be influenced by the tendency of LDR partners to avoid conflict, express affection and show positive attitude (Joseph & Afifi, 2010). These perceptions of PRT military service members are also in accordance with previous exploratory study conducted with PRT military spouses, since it was demonstrated that, during the deployment period, fewer conflicts occurred and reported higher intimacy and closeness with their romantic partners (Bóia et al., 2017).

Results also demonstrated higher significant results for sexual satisfaction in LDR Group compared to GCR group, which confirmed hypothesis 3 (i.e., LDR military members present higher levels of sexual satisfaction that those in GCR). Despite the physical distance, Portuguese military service members have the possibility to engage in online sexual activity with their partners, which can serve as a dyadic maintenance strategy, sexual idealization of the partner and sexual fantasies about the partner (Goldsmith & Byers, 2018a). The possibility to feed sexual fantasies involving partners can be associated with positive feelings about sexual relationship (Moyano, Byers, & Sierra, 2016). Goldsmith & Byers (2018a) also suggest that

there is a reinforcement of maintenance of relationship when there are more sexual fantasies involving the partner. In the same study, results indicated that individual meet their sexual needs in the absence of the partner, or when the partner is not available (different schedules, availability of a place with privacy, etc.) by adopting the practice of solitary sexual activities (e.g., masturbation, viewing pornography, reading erotic stories, etc.) and not looking for alternatives outside the relationship (Goldsmith & Byers, 2018b).

Hypothesis 4 was also confirmed, showing that the relational satisfaction, investment size and the quality of alternatives mediate the relation between the group (i.e., being in a LDR) and commitment). As theoretically mentioned, IM postulates that an individual will be more committed when experiencing more satisfaction with the partner; when perceiving less quality and less interest in alternative partners or situations; and when both partners are doing higher investment in the relationship (Rodrigues & Lopes, 2013). Thus, commitment is a result of the level of satisfaction, the perception of quality among alternatives and the investment on the relationship (Rusbult et al., 1998). The first simple mediation - relational satisfaction as mediator variable - showed that although the group was not direct significant predictor of commitment, its effect on this dependent variable occurred indirectly through the influence of the mediator relational satisfaction which supports IM and are in line with arguments already indicated about H2. The second simple mediation – investment size as mediator variable – demonstrated that the group had no significant direct effect on commitment, neither indirect effect when mediated by investment size and nor from investment size on commitment. These findings are in accordance with comparative statistics, i.e., which showed no significant difference between LDR and GCR groups, in terms of investment size. Third simple mediation – quality of alternatives as mediator variable – showed that despite being in LDR was not direct significant predictor of commitment, its effect on this dependent variable occurred indirectly through the influence of the mediator quality of alternatives. These findings also support IM which is replicated in present research for military members in a LDR. So H4 was partially confirmed once relational satisfaction and quality of alternatives mediate the relation between the group and commitment, but the mediation wasn't verified for the investment size variable, which means that being deployed in a LDR do not change this factor of the relationship.

Based on the findings from the sequential mediation conducted to test hypothesis 5 (communicational satisfaction and relational satisfaction sequentially mediates the relation between group and commitment), it was showed that the group was not a direct significant predictor of commitment, with the mediator variables being totally responsible on commitment.

Actually, a significant total effect was founded due to the indirect mediator effect from communicational satisfaction and / or relational satisfaction with this path explaining the effect variance on commitment. From the analysis, it was also showed that communicational satisfaction didn't mediate the effect from the group on commitment, i.e., no indirect significant effect from communicational satisfaction on commitment, but that indirect effect of communicational satisfaction was significant when sequentially mediated by relational satisfaction. So, H5 was totally confirmed and these findings corroborate that PRT military members might compensate geographical distance by improving their communication and, on the other hand, communication can be seen as an important factor in trying to maintain a relationship during separations (Carter & Renshaw, 2015). Furthermore, these findings from the current study are in line with the results from a qualitative exploratory studies with Portuguese military couples, which suggested that frequent communication between couples in LDR can reduce uncertainties, can help to sustain conjugal rituals, and while maintaining or strengthening the relationship, even at an intimate level (Barbudo et al., 2014) and the these communicational resources helped to maintain a psychological and emotional presence during the physical absence (Bóia et al., 2017).

Based on the findings from the sequential mediation performed to test hypothesis 6 (Communicational satisfaction with and relational satisfaction sequentially mediate the relation between group and sexual satisfaction), it was found that being a LDR was not direct significant predictor of sexual satisfaction and the indirect effect of communicational satisfaction was not significant. On the other hand, it was found a significant indirect effect of relational satisfaction which was significantly increased when sequentially mediated by communicational satisfaction. These findings replicated previous research indicating that partners in LDR engage more frequently in some sexual maintenance behaviors than individuals in GCR, also adopting the practice of solitary sexual activities (e.g., masturbation, viewing pornography, reading erotic stories, etc.) which might contribute to maintain sexual behaviors since, even in a solitary way, individuals meet their sexual needs in the absence of the partner and not looking for alternatives outside the relationship (Goldsmith & Byers, 2018b). The group, i.e. being in LDR, was significant predictor of sexual satisfaction when sequentially mediated by communicational satisfaction and relational satisfaction. The indirect effect of these two mediate variables, were responsible for the relationship between the group and sexual satisfaction. Therefore, these findings suggested that communicational satisfaction increases relational satisfaction which leads to increased sexual satisfaction (Byers, 2005) and partner's

communication as a crucial variable during military deployment (Carter & Renshaw, 2016a). Furthermore, these findings also demonstrate that in romantic relationships, sexual satisfaction is highly related to relational satisfaction (Pascoal, Narciso & Pereira, 2013) and corroborate studies which indicates a high interdependence of sexual satisfaction and relationship satisfaction (Fisher et al, 2014). Additionally, findings in current study are in line with previous study suggesting that, due to sexual challenges originated by physical separation, individuals in LDR adopt sexual behaviors with more frequency than individuals experiencing a GCR (Goldsmith & Byers, 2018b).

### **Limitations of the study**

The present study had some limitations to be outlined. First, the cross-sectional design of the research provides a general picture directed for a moment in time because this design cannot correct for temporal precedence. Secondly, the psychometric properties of the scale used to measure communicational satisfaction were not confirmed for this population. Additionally, despite the participations of military members from the three service branches, there are a reduced number from Navy and from Air Force. Another limitation was the age of the participants, once, in LDR group, 70% were under 30 years old, compared to 38% the GCR. Additionally, the percentage of female military members deployed (7%), does not permit to generalize the results as a common perspective of all genders.

### **Strengths of the study**

Despite the mentioned limitations, the present study also has some strengths. From what we know, this is the first study investigating military member's perceptions on romantic relational variables, i.e., commitment, relational satisfaction, and sexual satisfaction during the international military deployment by comparing military population in LDR versus GCR, which gives a perspective of the relational implications emerging from the military deployments. Furthermore, the sample collected was representative of the total number of PRT military members normally deployed. As far as we know, this was also pioneer research on exploring sexual satisfaction in military population during deployment period. Finally, a major strength lies on the excellent validity and reliability of the instruments to measure the variables of relational interest, namely, commitment, sexual satisfaction and relational satisfaction. The present study has also positive implications by offering recommendations and may contribute and motivate future research on LDR implications for PRT military members and their couples and families.

## **Conclusions**

The present study allows to better understand romantic relational perspectives from PRT military members during LDR in compare with PRT military members living a GCR. Investment Model (Rusbult, 1980, 1983) was replicated in this study by serving to examine relational perceptions in deployed and non-deployed military service members. Additionally, communicational satisfaction and sexual satisfaction were investigated to make a more complete picture of the relational variables. Findings totally confirmed hypothesis one (LDR members present higher levels of commitment than those in GCR), hypothesis two (LDR members present higher levels of relational satisfaction than those in GCR), hypothesis three (LDR Portuguese military members present higher levels of sexual satisfaction that those in GCR), hypothesis five (Communicational satisfaction and relational satisfaction sequentially mediate the relation between group and commitment) and hypothesis six (Communicational satisfaction and relational satisfaction sequentially mediate the relation between being in LDR and sexual satisfaction). Hypothesis four (Relational satisfaction, investment size and the quality of alternatives mediate the relation between being in an LDR and commitment) was partially confirmed, since the mediation wasn't verified for the investment size variable. In general, these results replicate and extend outcomes from previous exploratory researches conducted with PRT military members and partners and other studies and literature investigating romantic dimensions during LDR.

Overall, the findings of this study are in line with literature in which concerns to studied relational variables in LDR, whose results are also applicable to the military members when deployed in scenarios of conflict and instability. As the results suggested, communication is an important mediator in maintaining relational satisfaction, commitment, and sexual satisfaction, so it would be relevant to develop and maintain channels of communication accessible to deployed military members and their partners. It would be also important to ensure that deployed military personnel are able to communicate with partners in environments that guarantee privacy and allow intimacy.

Future studies should include more powerful instruments to assess communicational satisfaction and a longitudinal research would be a better choice to ensure more consistent results, as controlled for temporal precedence, in order to better understand how the effects between variables are established over time. On the other hand, a longitudinal study covering the all period from pre-deployment till some months after return, would be useful to understand possible long term effects on relational factors.

Moreover, it would be appropriate to combine quantitative and qualitative methodologies in studies to better investigate individual perceptions when military members live a period of a LDR, which could also be even more enriched if that study would include the perspectives from both partners, i.e., the deployed military member and the at-home partner.

### **Compliance with Ethical Standards and Conflict of Interest**

**Ethical Approval:** All procedures performed in this study involving human participants were in accordance with the ethical standards of Scientific Research Ethics and Deontology Commission of the Psychology and Life Sciences School of Universidade Lusófona and with the Helsinki Declaration. **Informed Consent:** Informed consent was obtained from all participants. The author declares that he has no conflict of interest.

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