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CONTENTS

■ Review

⬢ Research

▲ Experiences & Tools

● Discussion

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Pain management in ERAS® approach for abdominal surgery: A narrative review

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ABSTRACT. Tra tutte le fasi dell'intervento chirurgico, la fase preoperatoria è generalmente vissuta dal paziente con maggiore ansia. Studi in merito dimostrano che una maggiore percezione dell'ansia o paura nella fase preoperatoria sia scientificamente correlata a un decorso postoperatorio prolungato. Il dolore è annoverato tra le principali cause che recano ansia al paziente. L'obiettivo della presente revisione della letteratura è quello di esaminare la letteratura in merito alla gestione del dolore preoperatorio nei pazienti candidati alla chirurgia addominale, confrontando gli outcome clinici dei pazienti sottoposti a metodologia ERAS® con quelli ottenuti con una gestione perioperatoria tradizionale. Gli studi hanno dimostrato che l'analgesia perioperatoria è più efficace con il protocollo ERAS® rispetto ai trattamenti tradizionali. L'elemento chiave del protocollo ERAS® è la minimizzazione dello stress psicofisico legato all'intervento chirurgico, attraverso un approccio multimodale e multidisciplinare.

SUMMARY. Greater fear or distress prior to surgery is associated with a slower and more complicated postoperative recovery. The main objective of this study is to examine the best evidence of the perioperative pain management in patients candidated for abdominal surgery comparing the clinical outcomes achieved with the ERAS® protocol to those achieved with traditional perioperative management. The studies showed that perioperative analgesia was more effective with ERAS® protocol than with traditional treatments. The key element of the ERAS® protocol is to minimize the psychophysical stress related to the surgical intervention, through a multimodal and multidisciplinary approach.

Keywords: *Pain, Multimodal management, Abdominal surgery*

INTRODUCTION

Greater fear or distress prior to surgery is associated with a slower and more complicated postoperative recovery (Egbert, Battit, Welch & Barlett, 1964; Kiecolt-Glaser, Page, Marucha, MacCallum & Glaser, 1998). The *Enhanced Recovery After Surgery* (ERAS®) protocol was developed to achieve early recovery after surgical procedures. The key elements of ERAS® protocol are preoperative counselling, optimization of nutrition, standardized multimodal analgesic and anesthetic regimens and early mobilization.

The history of Enhances Recovery After Surgery (ERAS®)

The new term Enhanced Recovery After Surgery (ERAS) derives from the expression "improved recovery after surgery" which initially identified a philosophy of advanced management of the patient undergoing colorectal resective surgery and that aimed to optimize the perioperative path as already proposed by Kehlet (1997). In fact, Kehlet (1997) recommended a model to provide new standards of care and to improve clinical and care outcomes. These programs attempt to modify the physiological and psychological responses to major surgery (Fearon et al., 2005). In addition, ERAS® protocol can lead to a reduction of complications and hospital stay as well as to an earlier resumption of normal activities. Several single-center and multicenter studies, as well as a systematic review (Carmichael et al., 2017) affirmed that the benefit of ERAS® protocol is to significantly improving quality of life and psychosocial adjustment, reducing hospital length of stay, and reducing hospital costs also in other types of surgery. Various studies reported interesting results about this multimodal and multidisciplinary approach. For example, in a recent study, the postoperative hospitalization time was only 48 hours. Moreover, in the first two days after surgery, a significant number of patients, mobilized every 5 hours and started a fluid diet (2000 ml), had normal intestinal functions, reported a low intensity of pain and showed no medical or surgical complications in the following thirty days (Teixeira et al., 2018).

This model was the result of the most innovative anesthesiology techniques acquisition (see Table 1), the development of minimally invasive surgical techniques and the spread of evidence-based medicine and nursing (Dionigi, 2016; Kehlet & Mogensen, 1999).

In addition, the ERAS® protocol was developed from the results of the Fast Track model. The main objectives of the Fast Track protocol are early return to normal gastrointestinal functions, pain control, mobilization and reduction of complications, rational use of anesthesia techniques and analgesic measures, optimal perioperative management, choice of the best surgical technique and nutritional support modalities (Di Muzio et al., 2019). This translates into a significant reduction in postoperative complications, early mobilization, and in a reduction of the paralytic ileus, which permits a better recovery of the solid diet and an earlier return to normal intestinal function (Dionigi, 2016).

ERAS® in different surgical disciplines

Successful implementation of ERAS® pathway across the spectrum of surgical care could have a great impact on both patient outcomes and healthcare delivery systems. Initially, the ERAS® protocol has been developed for colorectal surgery, where it is considered as the best care. Several RCTs and meta-analyses showed that the introduction of ERAS® protocol to colorectal surgery decreased postoperative morbidity by 40-50% (Greco et al., 2014). In addition, a Cochrane review in colorectal surgery showed a reduction in length of stay and complication rates (Spanjersberg, Reurings, Keus & van Laarhoven, 2011).

Another meta-analysis (Yu et al., 2014) also showed the effectiveness of ERAS® pathway in the gastric surgeries, with a significant decrease in postoperative hospital stay.

Similar results have been reported in the ERAS® protocol implementation across the liver and pancreatic surgery. In fact, this protocol has a positive impact on perioperative care and it reduces operative risk (Lassen et al., 2012). Little is still known about the ERAS® pathway implementation for patients with cancer (Pędziwiatr et al., 2017).

What is ERAS®?

The ERAS® protocol is a multimodal program of interventions, divided into pre, intra and postoperative phases, with a multidisciplinary and integrated approach, designed to minimize metabolic stress and postoperative

Table 1 – Descriptions of various analgesic technique

Thoracic Epidural Analgesia (TEA)	This technique consists of inserting an epidural catheter in position T6-T8 for surgery in the upper abdominal regions, and in position T9-T11 for surgery in the lower abdominal quadrants.
Spinal analgesia	It has been shown that a single dose of local spinal anesthetic in combination with intrathecal administration of morphine or diamorphine is effective in reducing postoperative recovery time in patients treated with laparoscopic surgery (Levy, Scott, Fawcett, Fry & Rockall, 2011). In addition, the use of spinal analgesia in combination with intrathecal opioid is efficient in reducing systemic opioid demand in postoperative patients, improving analgesia (Wongyingsinn et al., 2012).
Abdominal wall blocks	Abdominal wall blocks, and in particular the blocks of the transverse plane of the abdomen (TAP-Block), consist of the infiltration of local anesthetics into the neurovascular plane located between the internal and transverse oblique muscles of the abdomen.
Intravenous lidocaine infusion	It is used as an adjuvant in systemic opioid therapy and lead to a better postoperative analgesia with a reduction in opioid consumption in postoperative, and an early postoperative recovery in particular for the gastrointestinal function (Carlisle & Stevenson, 2006).
Continuous infiltration of the surgical wound	This procedure consists of an infiltration of local anesthetics in the abdominal wound, after open surgery, and improves postoperative analgesia as well as reduces opioid consumption after surgery (Mendonça, Reis, Aguiar & Calvano, 2015).
Intraperitoneal administration of local anesthetics	Intraperitoneal nebulization of ropivacaine allows a more homogeneous distribution of the anesthetic in the abdomen and it is therefore more effective (Kahokehr, Sammour, Srinivasa & Hill, 2011).

organ dysfunctions and bring the patient back to autonomy in the shortest possible time (Di Muzio, 2014). The ERAS® protocol has different items to be performed during the patient surgical path, such as preoperative information and education, carbohydrate drink administration, both the evening before and the morning of the day of surgery, to reduce hunger and thirst, preoperative anxiety and postoperative insulin resistance (Di Muzio, 2014).

The success of a surgical procedure requires a multidisciplinary team approach (Chiarini et al., 2017; Di Muzio, Marinucci, De Benedictis & Tartaglini, 2017). Surgeons, anesthetists, nurses, dieticians, physiotherapists and psychologists, as members of the same surgical team, should be encouraged to consider themselves responsible at the same level of both the patient and the outcome, despite the need to have a project manager, who has the overall responsibility to plan, monitor and control all the phases of the project. Education and management of expectations, patient empowerment, psychological preparation for surgery increase coping strategies and improve the capacity to manage anxiety, one of the main risk factors for the onset of pain in postoperative care (Ayyadhah Alanazi, 2014). The fundamental point, in pain management (Sturgeon, 2014), is to implement alternative forms of pain control (see Table 2), rather than the traditional use of opioids.

Table 2 – Descriptions of psychological therapies for pain

Cognitive-behavioral therapy (CBT)	This approach applies biopsychosocial approach to pain that targets behavioral and cognitive responses to pain. It involves psychoeducation about pain, behavior, mood, strategies for relaxation, behavioral activation, positive event scheduling, effective communication, and cognitive restructuring for distorted and maladaptive thoughts about pain.
Mindfulness-based stress reduction	It promotes a nonjudgmental approach to pain and uncoupling of physical and psychological aspects of pain; teaches "nonstriving" responses to pain through experiential meditations and daily mindfulness practice intended to increase awareness of the body and proprioceptive signals, awareness of the breath, and development of mindful activities.
Acceptance and commitment therapy	It focuses on development of acceptance of mental events and pain and ceasing of maladaptive attempts to eliminate and control pain through avoidance and other problematic behaviors; emphasizes awareness, defusion, and acceptance of thoughts and emotions as well as behavioral engagement in pursuit of personal goals.
Operant-behavioral therapy	It focuses on extinguishing maladaptive behavioral responses and fostering of adaptive behavioral responses to pain. Behavioral responses are altered through reinforcement and punishment contingencies and extinction of associations between threat value of pain and physical behavior.

METHODS

A narrative review was conducted to examine the best evidence of the perioperative pain management in patients candidates for abdominal surgery comparing the clinical outcomes achieved with the ERAS® protocol to those achieved with traditional perioperative management.

To search the databases, the clinical research question was formulated according the Population and their problem, Intervention, Comparison, Outcomes and Methodology (PICOM) approach. The Population included adult patient with postoperative pain after abdominal surgery. The Intervention was the ERAS® pathway implementation, while the Comparison was the traditional management of postoperative in abdominal surgery. The Outcomes were a reduction of the intensity and a reduction of postoperative hospital stay. The PICOM method is shown in Table 3.

The "Enhanced Recovery After Surgery AND Abdominal Pain" search string was used to query several databases such as PsycINFO, Cochrane Database of Systematic Re-view, PubMed, CINAHL, in June and July 2019. This research identified 106 articles that were subjected to further screening for relevance of the study to the question, design of the study, type of intervention, data analysis and clinical relevance. At the end of the screening process, 8 studies were considered as most relevant for this review (see Figure 1).

Inclusion and exclusion criteria for the study were the following:

Inclusion criteria:

- studies of the ERAS® protocol's pain management techniques for abdominal surgery, including meta-analyses, systematic reviews, randomized clinical trials and retrospective studies;
- studies published in the last ten years, in Italian and English.

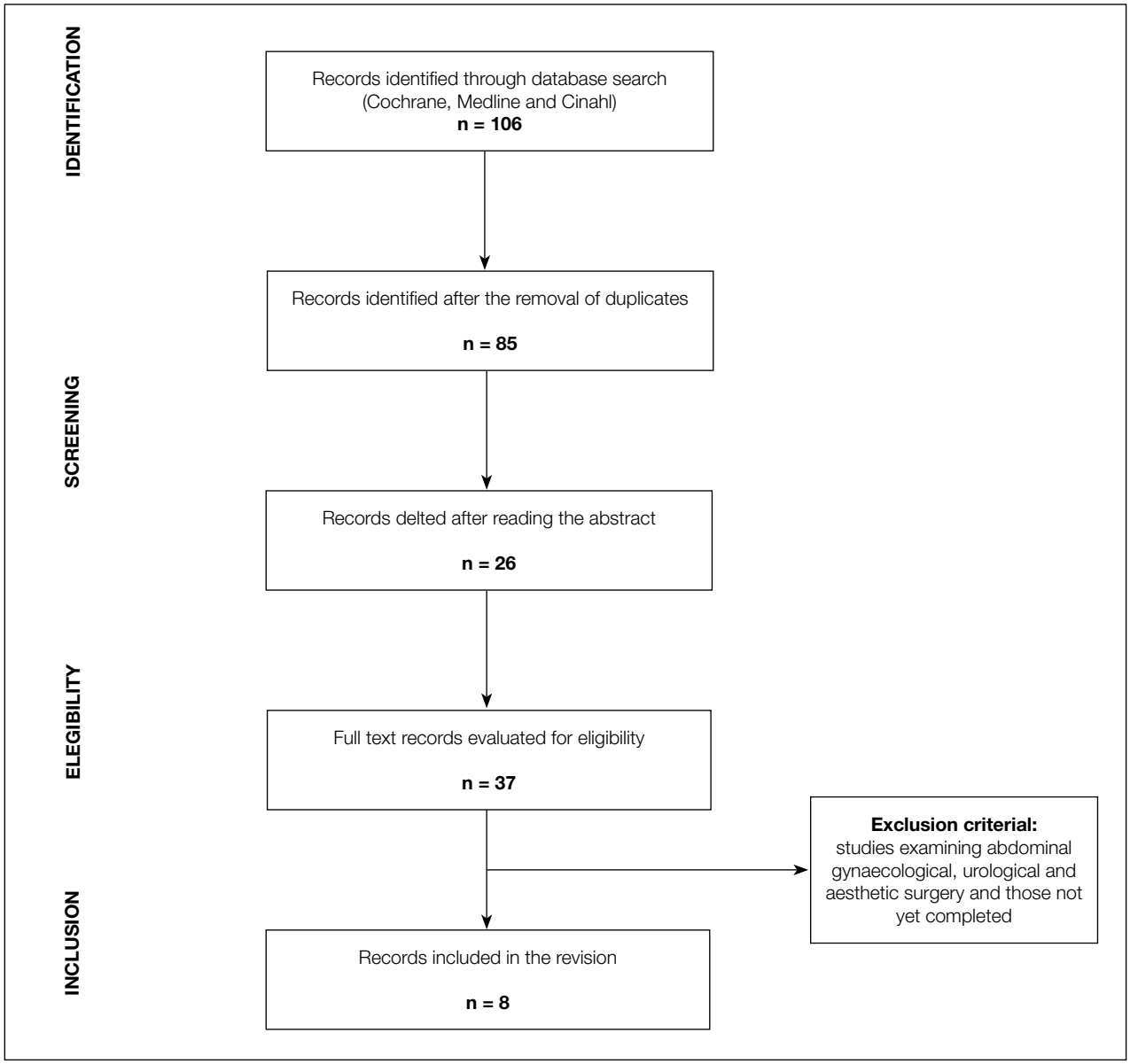
Exclusion criteria:

- studies examining gynecological, urological and aesthetic abdominal surgery and those not yet completed.

Table 3 – Clinical research question identified with the PICOM methodw

P (Population/Patient)	Adult patient with postoperative pain after abdominal surgery
I (Intervention)	Enhanced Recovery After Surgery Protocol
C (Comparison)	Traditional management of postoperative pain in abdominal surgery
O (Outcome)	Reduction of the intensity and duration of pain
M (Methodology)	RcT's, meta-analysis; systematic reviews; randomized and non-randomized clinical trials; retrospective studies

Figure 1 – Selection flowchart



RESULTS

Different studies have reported homogeneous results, especially in patients undergoing abdominal and colorectal surgery. In fact, these studies reported a reduction in the perception of pain, compared to patients in the control group, who received opiate drugs and reported several complications. The following data extraction table shows studies results (see Table 4):

DISCUSSION

The studies identified show results that are consistent with the aim of the research, which is to demonstrate that the use of the Enhanced Recovery After Surgery (ERAS®) protocol is more effective than the traditional approach in pain management for patients undergoing abdominal surgery. Sarin et al. (2016) proved that the use of the ERAS® protocol reduced intraoperative opioid consumption and

Table 4 – Outcomes of ERAS® protocol

Title and Author	Year	Journal	Type of study	Results and Discussions
"Predicting delayed discharge in a multimodal Enhanced Recovery Pathway" Keller, Tantchou, Flores-Gonzalez & Geisler	2017	A*merican Journal of Surgery*	The study was conducted with the aim of identifying the reasons for the failure of the ERAS® protocol and the factors that can lead to longer recovery times, despite the application of the protocol to colorectal surgery.	274 cases were included, 229 were successful and 45 were bankrupt. Bankruptcy is defined as the failure to achieve outcomes due to resignation within a period of 5 days. The reasons for the failure of the protocol were: high rates of preoperative anxiety (OR 2.28), pain (OR 10.03), and previous abdominal surgery.
"Effectiveness of continuous wound infusion of local anesthetics after abdominal surgeries" Dhanapal et al.	2017	*Journal of Surgical Research*	The study involves two groups of 47 patients who are candidates for abdominal surgery. The experimental group was treated with bupivacaine .25%, the control group with saline .9%. Both treatments were performed with preperitoneal catheterization, at a speed of 6ml/h for 48 hours. All patients received an auxiliary morphine treatment via PCA.	Total morphine consumption was much lower in the experimental group (18.8±2.2 mg) than in the control group (30.8±2.5 mg). The intensity of pain, measured with VAS scale, was lower in the bupivacaine group than in the placebo group. Intestinal functions were resumed early in the experimental group (69±2 hours), compared to the control group (76±3 hours).
"*Liposomal bupivacaine use in transversus abdominis plane blocks reduces pain and postoperative intravenous opioid requirement after colorectal surgery*" Stokes et al.	2017	*Diseases of the Colon and Rectum*	Retrospective study in order to evaluate the use of bupivacaine in the blocks of the transverse plane of the abdomen, correlating it to postoperative pain and opioid consumption, in colorectal surgery. The study group consisted of 303 patients, the control group of 104 patients.	Patients prescribed bupivacaine as a pharmacological agent to block the transverse plane of the abdomen had a significant reduction in pain in the first 36 hours after surgery ($p<.001$). Opioid use was lower in the study group (64.5 mg) than in the control group (99 mg).

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Title and Author	Year	Journal	Type of study	Results and Discussions
"Successful implementation of an Enhanced Recovery After Surgery program shortens length of stay and improves postoperative pain, and bowel and bladder function after colorectal surgery" Sarin et al.	2016	*BMC Anesthesiology*	The study involved 279 patients who underwent abdominal colorectal surgery using the ERAS® protocol, compared to 245 patients who underwent the same type of surgery prior to the implementation of the ERAS® program.	The study showed that the introduction of the protocol reduced intraoperative opioid consumption (99 *vs* 68 mg), opioid demand on the first two postoperative days (75 *vs* 142 mg), and pain intensity (VAS 2.1 *vs* 3.2; $p<.001$). Implementation of the protocol also reduced postoperative recovery times (4.1 *vs* 6 days), and readmission rates (9.4% *vs* 21%).
"Enhanced recovery after giant ventral hernia repair" Jensen, Brondum, Harling, Kehlet & Jorgensen	2016	*Hernia: The Journal of Hernias and Abdominal Wall Surgery*	32 patients undergoing ventral hernia repair according to the ERAS® model.	The analysis of the results, focuses on the reduction of recovery times compared to the traditional surgical approach (median of 3 *vs* 5 days); on the reduction of postoperative pain during the transition from supine to orthostatic position and after a walk of 6 meters.
"The effect of transversus abdominis plane blocks on postoperative pain in laparoscopic colorectal surgery: A prospective, randomized, double-blind trial" Keller et al.	2014	*Disease of the Colon and Rectum*	Randomized double-blind controlled trial involving 79 patients who underwent laparoscopic colorectal resection surgery in the election. 41 patients were treated with the TAP-Block technique, the remaining 38 patients were part of the control group.	TAP-Block treatment reduces postoperative pain more effectively than the use of opioids ($p<.01$). Recovery in the experimental group was shorter (median, 2 days), compared to the control group (median, 3 days). The readmission rate was very similar in both cases.
"Transversus abdominis plane blocks and enhanced recovery pathways: Making the 23-h hospital stay a realistic goal after laparoscopic colorectal surgery" Favuzza, Brady & Delaney	2013	*Surgical Endoscopy*	Study of 70 patients, 35 of whom were treated with TAP-Block, the remainder with a traditional approach.	The mean time for postoperative recovery was 2 days for patients belonging to the experimental group, and 3 days for patients in the control group. The use of opioids in the postoperative group was lower in the experimental group (31.8 mg) than in the non-treated TAP-Block group (85.4 mg). On the first postoperative day, 13 patients treated with TAP-Block and 1 patient in the control group were discharged.

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Title and Author	Year	Journal	Type of study	Results and Discussions
"Intravenous flurbiprofenaxetil accelerates restoration of bowel function after colorectal surgery" Xu, Tan, Chen, Lou & Chen	2008	*Canadian Journal of Anaesthesia*	Prospective, randomized, double-blind, placebo-controlled trial. Randomization was performed on 40 patients, candidates for colorectal surgery according to the ERAS® protocol, divided into two cohorts.	The experimental group received, 30 minutes before and 6 hours after the surgical incision, an intravenous administration of flurbiprofen, equal to 1 mg/Kg. An identical volume of placebo was administered to the control group. The experimental group showed early bowel remission (87±23 hours), compared to the control group (105±19 hours). In the first 24 hours, the experimental group also had better pain control than the placebo group (p<.001).

decreased postoperative recovery times (4.1 *vs* 6 days) as well as readmission rates (9.4% as against 21%). Jensen et al. (2016) studied 32 patients who underwent hernia surgery and treated with the ERAS® protocol.

The analysis of the results highlights the reduction of recovery times compared with traditional surgical approach (3 *vs* 5 days median) and the reduction of postoperative pain.

Xu et al. (2008), in a prospective randomized double-blind trial, demonstrated that the group of patients assigned to the experimental protocol had a faster intestinal recovery (87±23 hours) compared with the control group (105±19 hours). In addition, in the experimental group, the pain control during the first 24 hours after the operation was better than that of the group treated with a placebo (p<.001). This review confirms benefits of the application of the ERAS® protocol for pain management if compared with a traditional pain treatment. Multimodal analgesia techniques, as used in the ERAS® protocol, allow a better control of postoperative pain in patients undergoing abdominal surgery, both in the first hours after surgery and in the following hours.

The study conducted by Dhanapal et al. (2017) involved two groups of candidates for abdominal surgery. The experimental group was treated with .25% bupivacaine and the control group with a .9% physiological solution. The morphine consumption was lower in the experimental group (18.8±2.2 mg) than in the control group (30.8±2.5 mg). The pain intensity, measured by *Visual Analogic Scale* (VAS), was lower in the group treated with bupivacaine compared to the placebo group.

Stokes et al. (2017) compared the use of bupivacaine and opioid consumption to manage postoperative pain in colorectal surgery. Patients treated with bupivacaine had a significant reduction of pain in the first 36 hours after the operation (p<.001). Moreover, the use of opioids was lower in the treatment group compared to the control group.

As far as opioid consumption is concerned, the results derived from these studies show a marked reduction in the need for morphine in the postoperative period for patients treated with the ERAS® protocol. The lower need for opioids in postoperative pain control determines a reduction of the time interval necessary for a full recovery of the intestinal functions, in terms of intestinal activity normalization, oral feeding, and channeling of stool and gas delivery.

The analysis of the results emphasizes the reduction of recovery times compared with traditional surgical approach: patients treated with TAP-Block showed a significant reduction in pain in the first 36 hours after surgery, compared to patients undergoing opioid therapy.

Keller et al. (2014), in a randomized double-blind controlled trial, demonstrated that the TAP-Block treatment

reduces postoperative pain more effectively than opioids treatment ($p<.001$). Recovery times, in the experimental group, were shorter than in the control group (2 *vs* 3 days median). Favuzza et al. (2013) verified that the mean time for postoperative recovery was 2 days for patients in the experimental group treated with TAP-Block and 3 days for patients in the control group.

Opioid consumption was also lower in the experimental group compared to the control group (31.8 mg *vs* 85.4 mg).

Only one article included in the review is not consistent with the research aim. Keller et al. (2017) have developed this study with the purpose of identifying possible reasons for failure in the ERAS® protocol and the factors which would determine an increase in recovery times. Missing to achieve the outcome of discharge in the first 5 days was considered as a failure. The study included 274 cases and 45 failures were observed. High levels of preoperative anxiety, pain, previous abdominal surgery history were the reasons leading to the failure of the protocol.

CONCLUSIONS

The ERAS® protocol for pain management in abdominal surgery has been shown to be effective in dealing with postoperative pain control, reduction of opioid consumption and early recovery of mobility. In particular, reduction of opioid consumption prevents several conditions such as paralytic ileus and nausea, allowing early resumption of oral feeding and return of normal gastrointestinal activity. Effective pain management does not depend only on the analgesic technique, but also on individual factors. For this reason, it is necessary to consider elements such as knowledge of pain, the meaning that a person gives to it, environmental and social factors, level of stress, the knowledge about surgical procedure and the plan of the postoperative care, family and caregivers responses. Preventive education and psychology preparation for the intervention allow a conscious management of anxiety, a factor that affects the perception of pain, encouraging greater control of postoperative pain. According to ERAS® protocol, postoperative assistance to patients undergoing abdominal surgery is centered on the relationship of help and consists not only in technical but also in relational and educational interventions in order to support and to develop the person and the entire family empowerment. Further implementations in the treatment of pain under the ERAS® protocol for abdominal surgery are expected in the future. Many aspects still required further study to explore the effectiveness of the ERAS® protocol in other surgical realities. It could be very useful to focus further research on aspects such as: a) choice of distinct educational programs for the different stages starting from diagnosis, decision making to the intervention; b) identification of differences in the outcome associated with specific traits of patients' personality; c) identification of the emotional support provided by family, caregiver or psychologist to help patients to face the acute stress associated with surgery; d) elaboration of the long-term outcomes of ERAS® protocols, as assessed through repeated follow-up; e) assessment of the reliability and sensitivity of the measures of pain control and emotion monitoring in facing the distress associated with surgery; f) identification of the clinical, demographic and psychological characteristics of the subgroup of patients who require longer hospital stays than expected based on ERAS® protocol. Finally, these data would be stronger if replicated in multicenter, prospective studies.

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Online peer help: Its quality in an online service for adolescents

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ABSTRACT. Internet è la principale fonte di informazioni sulla salute per adolescenti e giovani adulti ed è possibile trovare online diversi gruppi, forum o comunità di adolescenti e giovani adulti che offrono aiuto tra pari. Un aspetto problematico legato a questo tipo di aiuto è la sua valutazione, non solo in termini di esito, ma anche in termini di processo. Utilizzando una metodologia mista (quantitativa e qualitativa), questo studio cerca di migliorare la comprensione delle dinamiche dell'aiuto online tra adolescenti, valutando quali sono i principali problemi degli utenti e la qualità del sostegno offerto tra pari. 82 chat tra adolescenti in un servizio online di aiuto tra pari, chiamato Youngle, vengono analizzate in termini di qualità dell'aiuto offerto. Gli adolescenti cercano aiuto online soprattutto per i problemi relazionali e la qualità complessiva dell'aiuto tra pari è elevata. Tuttavia, alcuni aspetti relativi alla capacità conversazionale richiedono interventi di miglioramento. Ad esempio, i pari sembrano usare modelli di comunicazione più frequentemente negativi quando si parla di sessualità. I risultati suggeriscono l'utilità dell'aiuto online tra pari per argomenti generici che riguardano l'adolescenza, come quelli relazionali, ma anche la necessità di fornire un aiuto specializzato per questioni specifiche che sembrano essere estremamente complesse per gli adolescenti, come quelle legate alla sessualità.

SUMMARY. Internet is the primary source of health-related information for adolescents and young adults and it is possible to find online several groups, forums or communities of teenagers and young adults that offer peer help. A problematic aspect related to this kind of help is its evaluation, not only in term of outcome but even in term of process. Using a mixed methodology (quantitative and qualitative) this study tries to improve our understanding of dynamics of online help among teenagers, by evaluating which are the principal users' problems and how is the quality of support offered by peers. 82 chats between adolescents in an online peer help service, called Youngle, are analyzed in term of quality of offered help. Adolescents seek online help most of all for relational problems and the overall quality of peer-help is high. However, some aspects related to conversational ability require improvement interventions. For example, peers seem to use more frequently negative communication patterns when talk about sexuality. Results suggest the utility of peer help for generic topics that concern adolescence, such as the relational ones, but even the need to provide specialized help for specific issues that appear to be extremely complex for adolescents, such as sexuality.

Keywords: *Online peer help, Adolescents, Peer help quality, Conversational skills*

INTRODUCTION

Online help and adolescents

The Internet is the primary source of health-related information for many people (Fergie, Hilton & Hunt, 2016), especially for adolescents and young adults. Internet sites offer young people valuable information about health, healthy behavior, risky behavior, sexual issues, drug abuse, stress, and mental illness, as well as the tools to address these issues (Wartella, Rideout, Montague, Beaudoin-Ryan & Lauricella, 2016). Many adolescents who experience emotional problems don't seek help from mental health professionals. Indeed, Gulliver, Griffiths and Christensen (2010) found that adolescents and young adults with mental disorders often face many barriers in attaining face-to-face support, including embarrassment, perceived stigma, underestimation of symptoms, and a preference for self-reliance. Sweeney, Donovan, March and Forbes 2016 similarly argue that access to several therapy tools increases in an online context. In fact, they claim that 70% of adolescents opt for online therapies when seeking out support for their problems (Sweeney et al., 2016). This helps to explain why so many support, therapy, and help services have been created online in recent years (Spence, Donovan, March, Kenardy & Hearn, 2017; Stasiak et al., 2016). Securing access to information, advice, support, and treatment increases the chance that a teenager will seek help (Myers & Vander Stoep, 2017). Moreover, several studies have attempted to assess the efficacy of specific treatments in online environments (Andersson et al., 2014; van der Zanden, Kramer, Gerrits & Cuijpers 2012).

Online peer help

A subgroup of services based on self-help, peer help, and professional help is also available online. In fact, it is possible to find several groups, forums, and online communities in which teenagers and young adults share information, establish goals, and offer support to their peers on a wide range of topics (e.g. somatic diseases or psychopathology).

Different studies have evaluated the efficacy of online peer support for young people. First, this form of peer help was evaluated for online group related to cancer care (e.g. Dickerson, Boehmke, Ogle & Brown, 2006; Lieberman, 2005). Recently, Nicholas and colleagues (2009) have highlighted the benefits and challenges related to the use of online peer help for adolescents with chronic kidney disease. Authors suggest the relevance of this medium to share information, obtain emotional reinforcement and reduce social isolation but pointed out the desire of many participants to meet face-to-face the other users, with some relevant worries about the possibility to maintain the safety and the confidentiality of participation to these groups. Even Horgan, Byrne and Brand (2013) have analyzed the use of a web site to offer online peer support for depression in young people: web site provide the possibility to offer and receive emotional and informational support.

Online peer help seems to have several benefits, including a greater tendency to share goals, reach difficult targets (due to geographical or physical factors), lower prices, and obtain information about symptoms and treatment. For all these reasons, online peer help can improve the problem-solving and decision-making skills of its users (Greiner, Chatton & Khazaal, 2017). However, it is also necessary to emphasize some of its more problematic aspects. Kim, Weinstein and Selman (2015) have explored, for example, the communication strategies used by online helpers for romantic relationships difficulties in online forum. They underlined a massive use of direct judgement. In 2004, for instance, Eysenbach and colleagues highlighted how difficult it was to assess the effectiveness of online peer help, arguing that it was often part of wider treatments involving several different types of professionals. In addition, studies that have focused on the modalities and quality of online peer help often focus on groups of adults who are considered peer because they share the same medical condition and not because of age. These groups are often studied by examining evaluation methods, motivations, and the efficacy of various teaching methods (McGee, Windes & Torres, 2017; Mostert & Snowball, 2013). Unfortunately, little is known about the support offered to address both physical and mental health problems. Ali, Farrer, Gulliver and Griffiths (2015), in their recent review, have similarly shown that little is known about the quality and type of support offered online, even though the characteristics, benefits, and risks associated with this information have been largely studied. Authors highlight that for psychological problems only one study have directly investigated the efficacy of online peer help between young people and it didn't show promising results.

Aim of the study

Since online peer help is especially important to both adolescents and young adults - not to mention the fact that the modalities and quality of support are rarely addressed in the scholarly literature - it is important to investigate the various communications that are aimed at peers.

For these reasons, the first aim of our study is to describe the main topics proposed by adolescents on a specific online service of peer to peer help. Secondarily we want to evaluate the quality of the help offered. The specific aims of our study include:

- describing the main topics addressed by peers;
- evaluating the quality of peer help provided online;
- examining the social support and communication abilities of peer counsellors;
- investigating the quality of online help and its relationship to the specific topics being discussed.

METHODS

Youngle: the selection of chats

In January 2013 a municipality of central Italy, with other important stakeholders - as a Region government - founded a Facebook page aimed to provide online peer help for adolescents and young people. In this online environment, people between 13 and 22 years of age can find help by interacting with trained peers, all of whom are between 14 and 19 years of age. For two days a week (between 9 pm and 11 pm) young people can chat anonymously with a trained peer, who is in turn supported by two psychologists. If a peer considers a user's problem to be critical in nature, he or she can suggest to the user chat with one of the project's psychologist or to see him or her in person. Peers are trained to suggest always a contact with a psychologist in the case of presence of suicide intentions.

We choose to enroll this service in our study because for two main reasons: (1) the high structured features of the service; (2) the fact that it is specifically constructed and intended for young people but does not provide for pre-defined discussion topics.

Informed consent was obtained by Youngle ("Youngle. Zona di Sopravvivenza", n.d.; "Youngle. Social Net Skills", n.d.) team; they contacted school's headmasters to present the project. Then the school council needs to give a preliminary approval and both students and parents are informed by a letter presenting the Youngle service and the informed consent for the research. Only the students who accept to participate were included.

All chats between users and peers are recorded and saved in an electronic archive. Anonymity is maintained by substituting the user's name with a numerical code. The archive features 251 chats that were carried out between January 2013 and December 2015 by 81 different users (62 females, 12 males, and 7 users whose gender is unknown). The ages of these users ranged from 13 to 25 years old (M = 17.23; SD = 2.31). We selected 82 chats from the archive, featuring 24 different users (20 females and 4 males). The age of these users ranged from 13 to 22 years old (M = 14.75; SD = 1.82). The inclusion/exclusion criteria shown in Table 1 was used to select all 82 chats. Because of the focus of our paper is on the quality of peer help we choose to exclude chats conducted by psychologist.

These 82 conversations resulted in 4899 conversational "turns," as below.

Youngle: Let's try together to find a solution!

User A: I'd really like to…

INSTRUMENTS

Quality of help

To evaluate the quality of help in each chat, we adapted a coding scheme that was used in a content analysis of Share in Trust, a Danish project (Fukkink, 2011; Fukkink & Hermanns, 2009a; Fukkink & Hermanns, 2009b). The interventions in this instance were evaluated using the following qualitative criteria: the peer offers an adequate support (*Offer Support*, OSu); the peer suggests an effective solution (*Offer Solution*, OSo); the peer considers seriously the user's problem (*Take Young Person Seriously*, TYPS); the peer puts the user at ease (*Put Young Person at Ease*, PYPE), the peer uses a comprehensible language (*Comprehensible*, Com); the peer organizes the conversation in a structured manner (*Structured Progress*, SPr); and the peers stimulate the user to think through his or her problem (*Stimulate Thinking*, ST). All seven dimensions were evaluated using a 5-point Likert scale, ranging from 1 (the criterion is absent) to 5 (the criterion

Table 1 – Inclusion/exclusion criteria for the chat selection process

Inclusion criteria	**f**
Chats between January 2013 and December 2015	251
Exclusion criteria	
Chats off-hour	21
Chats of users who contact Youngle just one time	34
Chats about information on Youngle or topics that are inappropriate for the service	68
Chats to offer feedback on received support	8
Chats between trained peers (i.e. internal communication)	13
Chats conducted by a psychologist	10
Chats interrupted by connection problems	13
Youngle welcomes a new user to the community	2
Total chats	**82**

is fully present), as shown in Table 2. The cut-off for every observed variable is 3: chats that obtained a score less than 3 are considered unsatisfactory.

Social support

The classification proposed by Cutrona and Suhr (1992) and adapted by Braithwaite, Waldron and Finn (1999) was used to assess the social support offered in online chats.

This approach is organized into five categories and several subtypes of social support, including: information support (Advice, Referrals to experts, Situation appraisal, and Teaching); tangible assistance (Perform direct task, Perform indirect task, Active participation, and Express willingness); esteem support (Compliment, Validation, Relief of blame, and Reassurance); network support (Access, Presence, and Companions); and emotional support (Relationship, Physical affection, Confidentiality, Sympathy, Understanding or empathy, Encouragement, Prayer, and Self disclosure). The assessment consisted of evaluating the presence (= 1) or absence (= 0) of each subtype.

Communication abilities: conversational skills and negative communication patterns

Inspired by Fukkink (2011), we created five categories in order to evaluate the conversational skills of Youngle's peers: Opening the conversation (e.g. "Hey how u doin'"); Conclusion ("Bye"); Stimulating the other person to talk ("Can you tell me more about that?"); Asking for more information about the situation ("Did you tell her how you feel about that?"); and Talking about disruptions ("Hi, are you still there?").

Considering the common factors that negatively influence help (Corey, 2018) we considered the negative aspects of helper/helped communication. Particularly, we identified five negative communication patterns, inspired by Jones' Psychotherapy Process Q-Sort adapted by Sirigatti (2007) and referred to therapist's action and attitudes. Judges had to evaluate every item as characteristic (1) or not characteristic (2) of every conversational turn. We chose some items related to therapist' behavior to evaluate the presence of 1) negative judgement (the peer conveys a sense of acceptance

Table 2 – Criteria for Quality of Peer Help Evaluation

Dimension QC	Likert Scale				
	1	**2**	**3**	**4**	**5**
OSu	Peer doesn't understand the request/reverse the roles	Peer tries to understand the request but fails to do that	Peer understands the request but partially fails to offer support	Peer offers support in a directive way	Peer offers support in a cooperative way
OSo	Peer doesn't propose solutions	Peer proposes solutions, but they aren't workable for user	Peer offers solutions in a very confused way	Peer offers solutions in a directive way	Peer offers solutions in a cooperative way
TYPS	Peer doesn't let the user explain the problem: he/she discredits it or underestimates it openly	Peer let the user explain the problem, but he/she doesn't try to deepen it or is impatience with respect to the problem	Peer doesn't underestimate or discredit the problem but makes no attempt to understand it more	Peer shows understanding but tries to ironize the situation to lighten it	Peer understands the situation and follows the user in his narrative
PYPE	Peer gives negative judgments or criticism explicitly	Peer Gives Negative judgments or criticism indirectly	Peer doesn't criticize but he/she doesn't facilitate the user neither	Peer attempts to facilitate the user by reassuring him	Peer facilitates the user by validating and showing understanding
Com	Peer is incomprehensible or offensive to the user	Peer is comprehensible but too confusing	Peer appears neutral, technical and detached	Peer is comprehensible but user still needs to ask for clarification	Peer uses a language completely in line with the user and he/she is appropriate to the context
SPr	Peer wanders constantly producing a derailment of the conversation	Peer makes attempts to direct the conversation but loses or abandons it	Peer follows the user's stream without trying to influence it	Peer follows the user's flow and attempts to bring it back to the theme but undeliberated	Peer follows the user's flow but tries to bring it back to the theme to maintain consistency
ST	Peer doesn't stimulate reflection and is too directive	Peer doesn't stimulate reflection in an effective way	Peer leaves room for the user to exhibit his reflections but doesn't actively stimulate them	Peer stimulates reflections in a directive way	Peer stimulates reflections by providing alternative points of view

Legenda. OSu = Offer Support; OSo = Offer Solution; TYPS = Take Young Person Seriously; PYPE = Put Young Person at Ease; Com = Comprehensible; SPr = Structured Progress; ST = Stimulate Thinking.

without judgment *vs* peer's comments express criticism or communicate that user's personality is unpleasant or disturbed; e.g. "You are so wrong!" or "That's not the way to behave!"); 2) appeal to guilt ("Come on, tell me or I will be sad" or "Do it for me"); 3) infantilization (the peer behaves like a teacher, in a didactic way or he/she is condescending and treats the patient with superiority; e.g. "Oooh good boy!" or "Poor baby!"); 4) competition (the peer is competitive; "Ah, so you play the guitar! Do you know I'm a pro guitar player!?!?"); and 5) tactlessness (the peer is cold, detached or tactless, his/her comments seem to be pronounced to be perceived by the user as disparaging or offensive).

DATA ANALYSIS

Each chat was coded separately by five impartial trained judges, graduated with a bachelor's degree in Psychological Science and Technique. To guarantee accuracy and ensure that the variables were assessed in an independent manner, three judges were asked to assess the quality of help, and two judges were asked to assess the Social Support, Conversational Skills, and Negative Communication Patterns. The judges were all graduates in science and psychological techniques, specializing in clinical psychology, enrolled on a voluntary basis and trained for evaluation; they had followed a short course (4 hours) on the procedures and the grids to be used. Considering the presence of three judges for the assessment of quality of help, we decided to calculate the Interclass Correlation Coefficient (ICC) of the "mean of k raters" type (Koo & Li, 2016). In the case of two judges, the evaluation concerned dichotomic variables, so the interrater reliability is assessed calculating the Cohen's Kappa (Banerjee, Capozzoli, McSweeney & Sinha, 2008). Kappa values less than .2 indicate poor agreement, values between .2 and .4 modest agreement, values between .41 and .60 moderate agreement, values between .61 and .80 good and values above .81 excellent agreement. Descriptive statistics were calculated for the collected data.

RESULTS

The chats focused on six main topics: 1) Relational Problems (RP), which involve difficulties building and maintaining good relationships with friends and colleagues; 2) Family Problems, which involve difficulties building and maintaining good relationships with family members (FP); 3) Self-Acceptance (SA), which involves confidence in one's body, self-esteem, and the ability to recognize one's abilities and strengths; 4) Health Problems (HP), which focus on chats about physical or mental disorders, suicidal ideation, and self-harm; 5) School Problems (SP), which involve problems in school performance or choosing an academic career; and 6) Sexuality (Sex), which encompasses chats about sexual orientation/identity, sexual performance, and fears of sexual transmitted diseases and/or unintended pregnancy.

Relational Problems are most common ($f = 32$), followed by Self-Acceptance ($f = 17$), Family Problems ($f = 13$), Health Problems ($f = 8$), School Problems ($f = 6$), and Sex ($f = 6$). The quality of help was assessed by applying inter-rater reliability tests to several categories (see Table 3).

In terms of the quality of peer help, we found that 54.88% of the chats were excellent, 39.02% were good, and only 6% were merely sufficient. Insofar as possible solutions were concerned, 93.90% of the chats were considered excellent-good. User consideration is either good or excellent in 96.30% of the chats and a similar number (96.34%) used comprehensible language. Conversational structure and support of autonomous thinking was good-excellent, as 89.02% and 87.80% of chats (respectively) met this standard. However, as Table 3 illustrates, some chats did receive unsatisfactory scores, especially the ability of peers to encourage reflection among users ($f = 8$).

For what concern offered support, frequencies of conversational turns identified as Social Support by the two judges are reported in Table 4.

Of the 4899 conversational turns, 676 are coded as a form of informational support by the two judges and so this form of support is the common form offered by peers. The second most common type of support is emotional support, showing up in 449 conversational turns. However, some types of social support are absent or rarely present. For example, the two judges are in agreement on the absence of perform indirect task and access as form of social support in conversational turns.

The assessment of the two judges about conversational skills and negative strategies are reported in Table 5.

Asking for more information was most common conversational skill used by peers ($f = 519$) followed by stimulating the other person to talk ($f = 124$). The ability to open the conversation in an adequate manner is identified in only 73 conversational turns.

Table 3 – Evaluation of quality of peer help

Quality of peer help	ICC	M	SD	Unsatisfactory chats (M<3)
OSu	.75	4.43	.67	4
OSo	.65	4.39	.65	2
TYPS	.75	4.80	.61	1
PYPE	.70	4.32	.78	4
Com	.86	4.83	.60	3
SPr	.80	4.29	.91	2
ST	.81	4.27	1.05	8
Average Score	–	4.47	.42	2

Legenda. ICC = Interclass Correlation Coefficient; OSu = Offer Support; OSo = Offer Solution; TYPS = Take Young Person Seriously; PYPE = Put Young Person at Ease; Com = Comprehensible; SPr = Structured Progress; ST = Stimulate Thinking.

The use of negative strategies is an interesting aspect of these exchanges because it concerns only three chats about sexuality. Peers used rarely these strategies: infantilization is identified in 6 conversational turns and judgement in 4. These strategies seemed to emerge when the peer either thought that the user's problem was unimportant or when he or she believed that they had just provided solutions to fix the problem:

Peer: Oh miss…tell me… do you want to hear something in particular? I'll tell you what I've already told you, guys with a girlfriend should be left alone.

Peers don't use negative strategies as appeal to guilt and competition.

DISCUSSION

The research presented here identifies the main issues addressed in a peer-oriented online help service (Youngle) and evaluates the quality of its services.

Among the problems proposed by adolescents, the relational ones are certainly the most present: the difficulties in building and maintaining functional relationships with other boys and girls or with adults seem to be the main motivation that encourages these young people to seek the support offered by this online service. It seems interesting to note that even family problems and self-acceptance are often discussed with the helpers and that only a small portion of users seek support regarding aspects related to physical health. It can be hypothesized that those who recognize themselves as people with a certain pathology are more inclined to enroll in specific support groups for the disease itself.

Regarding the focus of this research, the quality of peer help, the interventions of the helpers are, in most cases, positive and they demonstrate good management skills. Users presents heterogeneous types of problems, but many of these concern relationships, as suggested by Ali et al. (2015). In summary, relational problems are most common, especially ones relating to the user's ability to manage and modulate their personality in order to successfully maintain

Table 4 – Evaluation of social support

Supratypes	Subtypes	Cohen's k	Conversational turns identified by the two judges
Information support		.60	676
	Advice	.70	256
	Referrals to experts	.71	36
	Situation appraisal	.38	382
	Teaching	1.00	2
Tangible assistance		.47	56
	Perform direct task	1.00	1
	Perform indirect task	–	0
	Active participation	1.00	1
	Express willingness	.46	54
Esteem support		.44	215
	Compliments	.42	61
	Validation	.44	94
	Relief of blame	.60	16
	Reassurance	.44	44
Network support		.56	68
	Access	–	0
	Presence	.42	39
	Companions	.45	29
Emotional support		.52	449
	Relationship	.56	26
	Physical affection	1.00	1
	Confidentiality	.50	6
	Sympathy	.44	49
	Understanding	.57	37
	Encouragement	.53	185
	Prayer	.57	16
	Self-disclosure	.69	129

Table 5 – Conversational skills and negative strategies

Supratypes	Subtypes	Cohen's k	Conversational turns identified by the two judges
Conversational Skills			
	Opening the conversation	.55	73
	Stimulating the other person to talk	.45	124
	Asking for more information	.56	519
	Talking about disruptions	.71	49
	Conclusion	.41	91
Negative Strategies			
	Judgement	1.00	4
	Appeal to guilt	–	0
	Infantilization	.71	6
	Competition	–	0
	Tactless	1	2

their personal relationships. The second most common problem involves self-acceptance issues, as teenagers often search online for reassurance about personal characteristics that they are struggling to manage or accept. Interestingly enough, health and sex-related problems are the least common issues being addressed by Youngle. This is probably because several other websites are available to young people that offer information on sex-related pathologies, sexual identity, and other issues associated with sexuality.

Peers at Youngle were more likely to offer informational and emotional support to users. They not only suggested effective solutions for their users' problems, but they were able to do so in a sympathetic manner, one that focused on their peer-patients' emotional status.

Critical aspects concern the dysfunctional peer help intervention related to the use of negative communication patterns. Negative communication strategies are used only when the topic addressed is that of sexuality. In this case the helpers use interventions that involve negative judgments and a strong infantilization with the result of a devaluation of the other. As suggested by Kim et al. (2015) in these cases, the helpers, failing to use an empathic modality with the other, openly judge in a negative way the behavior or attitude presented and use a paternalistic approach to the problem.

This indicates that, although the peers do not feel the need to postpone the issue to psychologists, their ability to provide support is not enough. A lack of training and the presence of personal prejudice seems to negatively affect these types of exchanges, which in turn increases the likelihood that the relationship between user and peer will be contaminated.

In summary, adolescents can manage the requests for help that come from their peers. However, some aspects of

this process require additional training. For starters, the conversational skills of peers need to be improved. Moreover, training peers on the importance of cooperation could help them overcome some of the moralistic attitudes that emerge when relationship and sexuality issues are being addressed.

The most relevant limits of this study concern the absence of information about the users: to maintain the anonymity Youngle doesn't collect personal information about their users so they can provide even false data.

Furthermore, exchanges occur only via chat: users and peers cannot have face-to-face interaction and they have to maintain the visual anonymity. The use of a write form of communication can substantially influence the strategies used by peers to handle the problem presented by users.

Further studies should increase the number of chats to allow a comparison of quality of online help between topics, using quantitative instruments to evaluate the perception of service quality in peers and users.

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Attractiveness, gender, aptitude: What effects on hiring for managerial, male and female sex-typed jobs

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ABSTRACT. Molti studi hanno dimostrato che l'attrattività del candidato ha un forte effetto sulla valutazione e la decisione di assumere. Tuttavia, questi studi raramente hanno misurato simultaneamente l'attitudine di un candidato e la tipologia di genere tipica di un lavoro nel contesto delle professioni manageriali. Questo studio ha indagato il ruolo degli stereotipi (attrattività fisica e genere del candidato) e dell'attitudine del candidato sulla decisione di assumere. Alcuni reclutatori esperti (N = 58) hanno valutato otto ipotetici candidati in base al loro curriculum, l'assegnazione variava secondo un disegno di ricerca 2×2×2, che prevedeva tre variabili entro i partecipanti (genere × attrattività × attitudine alta/moderata) e due variabili tra i partecipanti (lavoro tipicamente di genere maschile/femminile; reclutatore maschile/femminile). I reclutatori hanno usato 9 scale per misurare la convenienza di assumere, la desiderabilità e l'utilità del candidato. Le analisi hanno rivelato effetti significativi sull'attrattiva del candidato e sulle capacità mentali generali (GMA). Per il lavoro manageriale prettamente maschile, gli uomini ricevevano valutazioni più alte delle donne, e l'opposto era per le occupazioni manageriali prettamente femminile.

SUMMARY. Many studies have shown that applicant attractiveness has a strong effect on hiring assessments and on hiring decisions. However, these studies have rarely simultaneously measured the applicant's aptitude and the job's sex-type in the context of managerial jobs. This study investigated the role of stereotypes (applicant's physical attractiveness and gender) and of applicant's aptitude on hiring decisions. Professional recruiters (N = 58) rated eight hypothetical applicants based on their resume, which was varied according to a 2×2×2 design including three within-participants variables (gender × attractiveness × high/moderate aptitude) and two between-participants variable (male/female job sex-type; male/female recruiter). Recruiters used 9 scales to measure the applicant's hirability, desirability and utility. The analyses revealed significant main effects of applicant attractiveness and general mental abilities (GMA). For the male sex-typed managerial job, men received higher ratings than women, and the opposite held for the female sex-typed managerial job.

Keywords: *Gender, Attractiveness, Aptitude, Job sex-type, Personnel selection, Hirability, Judgment*

INTRODUCTION

Despite the use of valid hiring methods, numerous biases (Bendick & Nunes, 2012) can threaten the reliability, validity, and fairness of these methods and affect hiring judgments from the initial impression to the final decision. Despite knowing the applicant's objective abilities, in personnel selection situations stereotype such as attractiveness and gender are known to bias hiring decisions. A "what is beautiful is good" stereotype (Berscheid & Walster, 1974; Dion, Berscheid & Walster, 1972) affords a variety of benefits for physically attractive applicants to the detriment of unattractive ones. In the context of attractiveness and gender-bias studies, and considering a lack-of-fit model (Heilman, 1983), the purpose of the present study was to understand how the independent variables of applicant's gender, attractiveness, and general mental abilities (GMA), and the job sex-type influence hiring decisions for managerial jobs.

The studies of attractiveness bias in hiring decisions often target commercial, business, or jobs in finance, or jobs in hospitality such as innkeepers. For these jobs, it is well known that appearance can improve sales and chances to obtain contracts or performance (Ahearne, Gruen & Burke-Jarvis, 1999; Fruhen, Watkins & Jones, 2015). However, we don't know if the attractiveness bias also operates for jobs that imply care, such as in the health-care fields. A recent study (Lee, Pitesa, Pillutla & Thau, 2015) showed that need for cooperation causes recruiters to prefer attractive male candidates while competition causes them to prefer non-attractive male candidates. A question arises whether the beauty bias influences recruiters even when they have to hire for care jobs such as medical jobs. We tested the impact of GMA and attractiveness in occupational contexts where links between attractiveness and judgment of aptitude have not yet been investigated. The study aimed to test hiring decisions and bias in an area where beauty is not normally considered and rarely explored: the medical professions. To test Heilman's model, we distinguished male and female job sex-typing specifically for managerial jobs. In some studies relative to this model the managerial jobs are confounded with male sex-typing. We sought to disambiguate these two factors by selecting both male and female sex-typed managerial jobs and hence studied whether recruitment is influenced by the managerial job's sex-type.

Attractiveness bias

Meta-analyses have confirmed the strength of the attractiveness bias (Hosoda, Stone-Romero & Coats, 2003; Tews, Stafford & Zhu, 2009), which is already present in infancy. Attractive people are perceived as more efficient (Talamas, Mavor & Perrett, 2016), more qualified and more competent (Desrumaux & Pohl, 2014; Dion et al., 1972; Jackson, Hunter & Hodge, 1995) than unattractive people. They are seen as more likely to possess a wide variety of positive qualities, such as intelligence and sympathy, and their work is judged to be of better quality (Drogosz & Levy, 1996). Based on the attractiveness halo, Talamas, Mavor, Axelsson, Sundelin, and Perrett (2016) showed a strong correlation between perceived attractiveness and perceived intelligence. More precisely, more eyelid-openness led to higher ratings of intelligence above and beyond the attractiveness halo. Attractive people are perceived as having more socially desirable features (Desrumaux, De Bosscher & Léoni, 2009; Dion et al., 1972). Accordingly, attractive persons are thought to be responsible for their success, whereas unattractive people are perceived as being responsible for their mistakes.

Moreover, and particularly in the work setting, attractiveness gives rise to positive reinforcement. Thus, beauty increases the chances of getting a job (Baert & Decuypere, 2014; Desrumaux & Pohl, 2014; Hosoda et al., 2003; Jawahar & Mattson, 2005; Ndobo, 2014; Ruffle & Shtudiner, 2015). Beautiful appearance favours callbacks in hiring process (Ruffle & Shtudiner, 2015), assessments of employees' potential (e.g., Marlowe, Schneider & Nelson, 1996). Candidates with the most beneficial Facebook picture obtain approximately 38% more job interview invitations compared to candidates with the least beneficial picture (Baert, 2018). In managerial jobs, the degree of perceived attractiveness in virtual team leaders influences the amount of trust generated in them (Guinalíu & Jordán, 2016). Based on this review, we expected a significant effect of beauty on hiring judgments.

Hypothesis 1: Attractive applicants will be rated higher than unattractive ones for managerial jobs.

Attractiveness bias, sex bias and job sex-type

According to the lack-of-fit model (Heilman, 1983; Heilman & Saruwatari, 1979; Heilman & Stopeck, 1985;

Welle & Heilman, 2007), the occupational gender bias results from an incongruity between the attributes of a person and the perceived nature of the job requirements. On one side of the model lies perceptions of work. Jobs become sex-typed by virtue of both the number of men and women who occupy them (for example, there are more men than women engineers) and the attributes deemed necessary for successful performance (a successful engineer may be expected to exhibit more male, or agentic, traits). On the other side of the lack-of-fit model lie the descriptive stereotypes of women (Welle & Heilman, 2007, p. 234). Women, more than men, are thought to harbor communal attributes, such as nurturance and relationship orientation (Bosak, Sczesny & Eagly, 2008). When the sex stereotype of an applicant fits the sex-type of the job, the applicant is thought to have what it takes to perform well.

If there is a mismatch between the two, as there often is when women are vying for jobs that are considered to be male sex-typed, then the expectation is that the person will not perform successfully in that job (Heilman & Eagly, 2008). Attractiveness in turn is a moderator variable. First, attractiveness enhances gender characteristics and increases perceptions of sex-related attributes. Thus, attractive women and men are respectively perceived as more feminine and more masculine than their less-endowed counterparts (Gillen & Sherman, 1980). Second, the role of attractiveness depends on whether the job is sex-typed. When a job is not sex-typed, feminine or masculine qualities of the applicant are expected and beauty is an asset, for both genders. When a job is sex-typed, qualities linked to the gender that exemplifies the job are seen as required for success.

Finally, the attractiveness bias depends upon the applicant's gender and the job the applicant is seeking. On one hand, beauty in a man increases his probability of being hired for all types of jobs except ones considered typically female. On the other hand, beauty in a woman increases her probability of being hired if she applies for a female-typed job or a non-managerial job (Heilman & Saruwatari, 1979; Heilman & Stopeck, 1985). Explaining how attractive women were not likely to be considered for male-stereotyped jobs in the workplace, some authors proposed the idea of a "beauty is beastly" effect (Braun, Peus & Frey, 2012). Johnson, Podratz, Dipboye and Gibbons (2010) confirmed this effect even for jobs where attractiveness was not required. In their study, if the job was one seen as male-dominated and where appearance was deemed unimportant (manager of research, director of finance, director of security, hardware sales, or construction supervisor), attractive women were not seen as suitable for the job.

Attractiveness bias, sex bias and managerial jobs

For a male-typed managerial job, an attractive man will be preferred over an unattractive one (Desrumaux-Zagrodnicki, Leoni & Masclet, 2003; Heilman, Block, Martell & Simon, 1989). Moreover, a beautiful woman will be rejected because of the accentuation of her perceived feminine attributes. For this reason, attractive women are rejected for male-typed jobs. Managerial jobs are usually male-typed. Finally, an attractive woman would receive low ratings for managerial jobs because of the lack of fit (Heilman & Saruwatari, 1979; Heilman & Stopeck, 1985). Banchefsky, Westfall, Park and Judd (2016) found that feminine appearance affected career judgments for women scientists: increasing femininity decreased the perceived likelihood of being a scientist and increased the perceived likelihood of being an early childhood educator.

Confirming the "beauty is beastly" effect, Johnson et al. (2010) found in two studies that attractiveness can be detrimental for women who apply for male-typed jobs for which physical appearance is perceived as unimportant. In summary, many researches confirm that, for managerial jobs, beautiful woman would be disadvantaged (Heilman & Saruwatari, 1979; Heilman & Stopeck, 1985; Johnson et al., 2010). However, other studies (Desrumaux & Pohl, 2014; Jawahar & Mattson, 2005) did not find these results. Based on this discussion, we expected that the attractiveness bias would be influenced by sex bias and job sex-typing.

Hypothesis 2: Among attractive applicants, women will obtain the lower ratings for the male-typed job but the higher ratings for the female-typed job. Attractive male applicants will not be distinguished whatever the job's sex-type.

Attractiveness and aptitudes

Bendick and Nunes (2012) maintained that testing could change employers' behaviors and reduce bias, and indeed, knowledge of applicants' aptitudes or experience can influence judgments or hirability ratings (Desrumaux et al., 2009; Desrumaux & Pohl, 2014). However, studies on

biases have often failed to include validated variables such as the applicant's aptitudes. In a study including attractiveness and GMA, it was shown that GMA strongly influenced hiring decisions (Tews et al., 2009). However, no studies on hiring decisions, have included aptitude or GMA as an independent variable in a design that also takes into account attractiveness, gender and job sex-type. Yet several studies (e.g., Eagly, Ashmore, Makhijani & Longo, 1991) have shown that it is chiefly when the dependent variables describe social dimensions (e.g. sociability, popularity, extraversion) that physically attractive people are rated more favorably than less attractive ones; when the features are work-related (skillful, hardworking), physical attractiveness is much less determinative.

Hypothesis 3: Recruiters will strongly favor attractiveness when the applicant's aptitudes are weak.

METHOD

Participants

Participants were 58 recruiters from Paris and Northern France between the ages of 29 and 58 (M age = 33.13, SD = 9.94). They were working in recruitment offices or in in-house recruitment services of enterprises and were professionally experienced (M years = 6.1, SD = 6.13). 35 were working in enterprises as company recruiters (including 6 in public enterprises and 29 in private enterprises) and 14 were working in-office recruiters, 9 recruiters in Information Technologies Services Companies). They were trained in human resources (27), psychology (15), commerce (8), law (6), finance and bank (2). They were randomly assigned to two equal groups. One group (10 men and 19 women) rated applicants for a managerial job that was male sex-typed (medical doctor-surgeon). The other group (12 men and 17 women) rated applicants for a managerial job that was female sex-typed (medical doctor-nutritionist).

Materials

– *Photographs (facial attractiveness)*

Sixty-nine students and workers at various jobs (men and women, age range 21 to 67 years, M = 33.86, SD = 12.51) were asked to rate the attractiveness of people shown in photographs who (1) were White; (2) were 25-30 years old; (3) were not wearing glasses; (4) had a face of average size and shape; (5) were smiling; (6) were clean shaven.

The participants rated 60 men's and 48 women's photographs on a scale ranging from 1 (*not at all attractive*) to 9 (*very attractive*). Based on these ratings, eight photographs (*four men and four women*) were selected for the male sex-typed job and eight photographs (*four men and four women*) were selected for the female sex-typed job.

For each job sex-type and each gender, two attractive photographs and two unattractive photographs were chosen.

Three analyses of attractiveness were conducted on the men's photographs: attractive men's photographs were not significantly different from one another, $F_{(3,\ 204)} = .17$, *ns*; unattractive men's photographs also did not differ from one another, $F_{(3,\ 204)} = 1.82$, *ns*; but as required, attractive and unattractive men's photographs differed significantly, $F_{(1,\ 68)} = 57.52$, $p<.001$. The same three analyses were conducted on the women's photographs: attractive women's photographs did not differ from one another, $F_{(3,\ 204)} = .26$, *ns*; nor did unattractive ones, $F_{(3,\ 204)} = .31$, *ns*; but as required, attractive and unattractive women's photographs differed significantly, $F_{(1,\ 68)} = 177.25$, $p<.001$. The last analysis yielded no difference between the photographs of men and women for attractive and unattractive photographs, $F_{(1,\ 68)} = .88$, *ns* and no significant interaction between gender and attractiveness, $F_{(1,\ 68)} = .01$, *ns*. The same materials were used for the two groups.

Finally, attractiveness averages of the four photographs of attractive men were M = 5.40, SD = 1.96; M = 5.39, SD = 1.88; M = 5.38, SD = 1.92 and M = 5.25, SD = 1.85; of the four photographs of unattractive men were M = 2.81, SD = 2.09; M = 3.13, SD = 1.97; M = 3.13, SD = 1.78 and M = 3.19, SD = 2.22; of the four photographs of attractive women were M = 5.54, SD = 1.64; M = 5.42, SD = 1.86; M = 5.49, SD = 1.89 and M = 5.65, SD = 1.60; and of the four photographs of unattractive women were M = 3.33, SD = 1.56; M = 3.20, SD = 1.75; M = 3.35, SD = 1.53 and M = 3.19, SD = 1.70.

– *Jobs*

Seventy-two participants (36 men and 36 women) pursuing various training and occupational jobs, aged 20 to 67 years (M = 31.92, SD = 11.38) rated 107 jobs on a Likert-type scale ranging from 1 (entirely female) to 9 (entirely

male). These jobs were related to six sectors (social, medical, insurance/banking, services, production/industry and art) and concerned non-managerial and managerial jobs. The only information given about each job was its name.

Two jobs in the medical field were chosen: one managerial male sex-typed (Medical Doctor Surgeon) (M = 6.35, SD = 1.40) and one managerial female sex-typed (Medical Doctor Nutritionist) (M = 3.97, SD = 1.32). In regard to ratings of the sex-type of the job, the male-typed necessarily differed significantly from the female-typed, $F_{(1, 71)} = 86.40$, $p<.001$.

– *Vignettes submitted to recruiters*

Each application comprised one CV that included one color photograph and the results of an intelligence test (high aptitude or middle aptitude). In the CV, the information always included the training and the diploma. Only the city and kind of hospital changed. Occupational experiences were similar. For example, for the surgeon job, all the applicants were surgeons who had finished their medical training and their surgical internship (12 years total) and had been working in their field for three years.

Dependent variables

The dependent variables were nine scales measuring perceived hirability, perceived experience, perceived competence (together measuring hirability), dynamism, intelligence and hardworking character (together measuring utility) and sympathy, honesty, agreeableness (together measuring desirability). In addition, the 9 scores were collapsed to yield a single "favorableness" score.

Procedure and design

Experimentators met the recruiters in their companies or offices. The recruiters did not come to the laboratory and weren't paid. They had to rate applicants for either a surgeon job or a medical doctor nutritionist job. Recruiters were randomly assigned to two groups. One group rated eight CVs for the surgeon job (male sex-typed job). The other group rated eight CVs for the medical doctor nutritionist job (female sex-typed job). Recruiters examined 8 CVs with three changing characteristics (the applicant's gender, physical appearance and aptitude. They rated eight hypothetical applicants based on their resume, which was varied according to a 2×2×2 design including three within-participants variables (gender × attractiveness × high/moderate aptitude) and two between-participants variable (male/female job sex-type; male/female recruiter). The three within-subjects factors were precisely: applicants' gender (male *vs* female), physical appearance (attractive *vs* unattractive) and aptitude (high *vs* moderate). For each job, eight resumes were generated that varied according to the 2×2×2 within-subjects design. On one hand, the photographs of attractive men and woman and the photographs of unattractive ones, were rotated across the various conditions (high aptitude/middle aptitude). Recruiters had to rate each of the eight applicants on all 9 scales. For each scale, they put a cross on a 10-cm analog scale anchored by "0 = not at all" and "10 = entirely". Each scale was given a numeric score by counting the number of centimeters and millimeters from "not at all" to judge's cross mark and converted to numbers (in centimeters and with two decimals). The final DV was a global rating combining all 9 scales (max. score = 90).

Two documents were used: one described the job to be filled (job description) and the other described the applicant (resume). The two job descriptions of medical doctors, one for a surgeon and one for a doctor nutritionist, briefly presented the hospital, the tasks, and the activities to be performed. The fictitious applicants were described via their resumes. Each resume included standard information such as the applicant's age, marital status (unmarried), interests, level of education, work experience and a photograph of the applicant's face. These characteristics were essentially the same for each job sex-type. The amount of education (twelve years of training in the faculty of medicine and the degree were the same (only the city where the applicant obtained the degree changed). Work experience was the same. Resumes were rotated and counterbalanced. The photographs (of the same level of attractiveness) were also rotated and counterbalanced across the various conditions.

In order to manipulate the aptitude level, the recruiters were informed of the results of a GMA test. The GMA test was the *DAT-5* (*Differential Aptitude Tests*), which measured verbal, spatial, and numeric abilities. As Schmidt and Hunter (2004) showed, general mental ability tests are among the best predictors of performance. The resume explained the aptitude scores and rated the applicant's results as showing either moderate or high general ability.

One group of recruiters rated the applicants for the male sex-typed managerial job, the other group rated those for the female sex-typed managerial job. The recruiter was asked to first read the job description for which the eight applicants were to be rated. Then, the recruiter read the 8 resumes relating to the job. After reading each resume, the participant rated it on each of the nine scales using the 10 cm analog scale anchored at the low end with " 0 = not at all" and at the high end with "10 = entirely". For each job, the presentation order of the 8 resumes was counterbalanced. The recruiter's gender was not included as a factor but its effect was measured and controlled.

RESULTS

In a preliminary analysis, we examined the descriptive data (see Table 1 and Table 2), and in a second analysis, we tested hypotheses with a variance analysis with repeated measurements. Statistical analyses were computed with Statistica 12 software.

Descriptive analysis

In order to assess the relationships among the three dimensions (hirability, utility, desirability), a correlation matrix was drawn up (see Table 1). The recruiters provided the scale ratings (see Table 2).

The correlations between the scales were mostly significant. Out of 36 tested correlations, 29 were significant and all went in the expected direction. The seven non-significant correlations related to the adjective "experienced". The adjective experienced was only significantly related to the adjective "hirable". A psychometric analysis indicated a satisfactory reliability coefficient (Cronbach's Alpha = .97) which means that all scales contributed to measuring the same positive/negative judgment factor. The analysis dealt with the overall "favorableness" rating. The probability of getting the job was measured with 9 adjectives: 3 for hirability ("hirable", "experienced", "competent") (Cronbach's Alpha = .90), 3 for desirability ("sympathetic", "honest" and "agreeable") (Cronbach's Alpha = .93) and 3 for utility ("dynamic", "intelligent" and "hard-working" (Cronbach's Alpha = .93) (see Table 2). All these scales were summed and a univariate, repeated measures analysis was conducted on the composite score to determine the effects of the applicant's perceived attractiveness, gender and aptitude and the job's sex-type on the composite "favorableness" score.

Subscale ratings of favorableness

For each applicant profile (eight vignettes), means and standard deviations are presented in Table 2.

Test of hypotheses: variance analysis with repeated measurements

The variance analysis with repeated measurements (see Table 3 and Table 4) showed significant main effects for the applicant's attractiveness, $F_{(1, 54)} = 97.74$, $\eta^2 = .99$, $p<.001$ and aptitude, $F_{(1, 54)} = 34.74$, $\eta^2 = .97$, $p<.001$). Attractive applicants received higher ratings than unattractive ones, and highly able applicants were rated as more suitable for hiring than moderately able ones. There was no significant main effects for the applicant's gender, $F_{(1, 54)} = .05$, *ns*, for the job sex-type, $F_{(1, 54)} = .14$, *ns*, and for recruiters' gender, $F_{(1, 54)} = .39$, *ns*. In order to test Hypothesis 1, which proposes that attractive applicants will have higher ratings than unattractive ones, we examined the main effect of attractiveness on favorableness. Hypothesis 1 was confirmed. Attractive applicants were rated higher than unattractive ones for managerial jobs.

Next, we tested Hypothesis 2, which states that attractive women applicants will obtain the lowest ratings for the male sex-typed job but will obtain the highest ratings for the female sex-typed job. Attractive male applicants will not be distinguished whatever the job sex-type. This hypothesized interaction was tested by examining the three way interaction between applicant's gender, applicant's attractiveness, and job sex-type The triple interaction was significant, $F_{(1, 54)} = 7.68$, $\eta^2 = .88$, $p<.01$. Attractiveness did not help women who were applying for the female sex-typed job. But for non-attractive applicants, women were advantaged over men for female sex-typed jobs, and men were advantaged over women for male sex-typed jobs. Hypothesis 2 was not supported. To test Hypothesis 3, we examined the interaction between attractiveness and aptitude. The interaction between aptitude and attractiveness was not statistically significant, $F_{(1, 54)} = 1.99$, *ns*. Therefore, Hypothesis 3 was not confirmed.

Table 1 – Between-item correlation matrix for the 9 scales

	Hirable	Experienced	Competent	Sympathic	Agreable	Honest	Intelligent	Hard-working	Dynamic
Experienced	.19*								
Competent	.77*	.06							
Sympathic	.74*	.01	.77*						
Agreable	.64*	−.05	.60*	.83*					
Honest	.70*	−.00	.66*	.79*	.79*				
Intelligent	.72*	−.06	.76*	.80*	.77*	.74*			
Hard-working	.75*	.05	.88*	.77*	.62*	.68*	.82*		
Dynamic	.62*	.02	.56*	.82*	.78*	.73*	.77*	.64*	
M	6.17	6.22	6.33	6.30	6.29	6.39	6.67	6.61	6.36
SD	.92	.40	1.08	1.14	1.18	1.09	1.10	1.01	.99
Cronbach's Alpha	.74	.84	.81	.89	.86	.80	.88	.82	.84
Asymmetry	.22	.01	.28	.55	.58	.16	.62	.53	.44
Flattening	−.35	−1.31	−.06	.67	.27	−.42	−.01	.01	.18

Note. $N = 58$; * $p<.05$.

Table 2 – Means and standard deviations of favorableness ratings for male typed job/female typed job and managerial male typed job/female typed job

	Managerial female sex-type		Managerial male sex-type		Sum	
	M	**SD**	**M**	**SD**	**M**	**SD**
Men						
Attractive highly apt	7.20	.89	7.20	1.03	7.20	.96
Attractive moderately apt	6.21	1.57	6.47	1.06	6.34	1.34
Unattractive highly apt	6.40	1.11	6.60	1.04	6.50	1.07
Unattractive moderately apt	5.53	1.53	5.61	1.14	5.57	1.34
Women						
Attractive highly apt	7.18	.92	7.14	1.08	7.16	1.00
Attractive moderately apt	6.28	1.36	6.30	1.10	6.29	1.23
Unattractive highly apt	6.76	1.07	6.27	1.21	6.52	1.16
Unattractive moderately apt	5.87	1.39	5.18	1.20	5.52	1.33

Note. The higher the ratings, the more favorable is the judgment.

Table 3 – Repeated measures variance analysis for favorableness score (9 scales)

	df	MC	df error	MC error	F	p
Recruiters' gender	1	2.83	54	7.13	.39	.53
Attractiveness	1	48.58	54	.46	97.74***	.001
Applicant gender	1	.03	54	.57	.05	.82
Applicant aptitude	1	86.43	54	2.49	34.74***	.001
Job sex-type	1	1.05	54	7.13	.14	.70
Attractiveness × Aptitude	1	.49	54	.24	1.99	.16
Applicant gender × Attractiveness × Job sex-type	1	2.11	54	.28	7.68**	.007

Legenda. df = degree of freedom.
Note. ** $p<.01$, *** $p<.001$

Table 4 – Multiple variance analysis with repeated measurements for favorableness score (all calculations)

	SC	df	MC	F	p
Ord. Orig.	17609.42	1	17609.42	2471.468	.000000
Recruiters' gender	2.83	1	2.83	.397	.531283
Job sex-type	1.05	1	1.05	.147	.702938
Recruiters' gender*Job sex-type	.04	1	.04	.005	.943112
Error	384.75	54	7.13		
S	.03	1	.03	.050	.824212
S*Recruiters' gender	.18	1	.18	.319	.574275
S*Job sex-type	3.97	1	3.97	6.922	.011072
S*Recruiters' gender*Job sex-type	1.12	1	1.12	1.952	.168035
Error	30.96	54	.57		
A	48.58	1	48.58	97.749	.000000
A*Recruiters' gender	3.98	1	3.98	8.006	.006531
A*Job sex-type	1.47	1	1.47	2.950	.091587
A*Recruiters' gender*Job sex-type	.45	1	.45	.907	.345252
Error	26.84	54	.50		
C	86.43	1	86.43	34.747	.000000
C*Recruiters' gender	.57	1	.57	.229	.634507
C*Job sex-type	.03	1	.03	.010	.919421
C*Recruiters' gender*Job sex-type	.23	1	.23	.092	.762284
Error	134.31	54	2.49		
S*A	.06	1	.06	.234	.630331
S*A*Recruiters' gender	.12	1	.12	.438	.511068
S*A*Job sex-type	.11	1	2.11	7.680	.007643
S*A*Recruiters' gender*Job sex-type	.06	1	.06	.209	.649413
Error	14.85	54	.28		

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	SC	df	MC	F	p
S*C	.02	1	.02	.199	.657615
S*C*Recruiters' gender	.15	1	.15	1.526	.222118
S*C*Job sex-type	.16	1	.16	1.633	.206789
S*C*Recruiters' gender*Job sex-type	.08	1	.08	.845	.362198
Error	5.41	54	.10		
A*C	.49	1	.49	1.990	.164045
A*C*Recruiters' gender	.47	1	.47	1.940	.169328
A*C*Job sex-type	.82	1	.82	3.350	.072711
A*C*Recruiters' gender*Job sex-type	.03	1	.03	.140	.710095
Error	13.20	54	.24		
S*A*C	.00	1	.00	.028	.868614
S*A*C*Recruiters' gender	.02	1	.02	.109	.742155
S*A*C*Job sex-type	.07	1	.07	.418	.520446
S*A*C*Recruiters' gender*Job sex-type	.21	1	.21	1.205	.277148
Error	9.23	54	.17		

Legenda. df = degree of freedom; S = applicant sex; A = attractiveness; C = aptitude.

DISCUSSION

This study dealt with the effects of attractiveness, gender, job sex-type, and aptitude for medical jobs. Previous studies have always concerned commercial or financial areas, human relations (receptionist), or technical jobs (accountant) but no studies have dealt with the differential effects of physical attractiveness, gender, and job sex-type in the context of the caring professions. Contrary to many studies (measuring students' judgments), we measured ratings by experienced decision-makers or HRM (human resource management) specialists, which certainly improves the external validity of this kind of study. Many studies concerning the effects of attractiveness and gender on hiring decisions use ecologically dubious experimental designs (for example, in some studies recruiters rate only one applicant profile for a job; in others, they rate one profile for several different jobs). The present study aimed at assessing the suitability of applicants for two different managerial jobs within a more realistic design.

Despite having given aptitude tests results about the applicants, the study showed that hiring remained significantly vulnerable to bias. Our results confirmed the

attractiveness effect (H1) predictable from previous studies (Desrumaux et al., 2009; Desrumaux & Pohl, 2014; Hosoda et al., 2003; Jawahar & Mattson, 2005; Marlowe et al., 1996; Ruffle & Shtudiner, 2015). Attractiveness had a strong effect and plays an important role in people's judgments of others on numerous traits linked to people's desirability and utility. The fact that attractive managers in the medical field are preferred to unattractive ones seems to result because attractiveness in managers exerts an influence on the trust generated in them (Guinalíu & Jordán, 2016). This study did not find that attractiveness was more beneficial for women applying for female sex-typed jobs than male sex-typed jobs. This negative result was obtained previously (Desrumaux, 2005; Desrumaux & Pohl, 2014). Thus, the attractiveness effects predicted by Heilman's model were not found, but recall that in accordance with the lack of fit model, attractive women would be discriminated against for male sex-typed jobs and unattractive women would be preferred over attractive ones for those jobs. These results invite to test Heilman's lack of fit model. A meta-analysis by Hosoda et al. (2003) of 27 studies testing Heilman's model predicts interactions between applicant's gender and attractiveness. Theory of beauty as a predominant factor has shown that attractive applicants are rated more favorably independently of gender and the nature of the job. More precisely, studies measuring conjugating effects of applicants' appearances and gender (Desrumaux, 2005, 2011; Desrumaux et al., 2009) didn't show a rejection of attractive woman for managerial jobs: the more applicants were perceived as attractive, the more they were considered as hirable and competent. Data obtained by Drogosz and Levy (1996), Jawahar and Mattson (2005) and Hosoda et al. (2003) imply that the attractiveness bias is more salient today than the gender bias. Finally, attractive applicants were perceived here as more suitable for hiring, more useful, and more desirable. Attractiveness increased not only the chances of getting a job but interacted with many other variables.

Limitations

This study has some limitations that need to be addressed here. First, the sample of recruiters was relatively small. The fact that we collected the judgments of HRM specialists or experienced recruiters was an added value for this study, but it was difficult to obtain their participation. Moreover, even though we directly surveyed recruiters or HRM specialists, the situation still didn't precisely model a real-life hiring situation. Second, the attractiveness manipulation was limited to a photograph of the face. Yet, physical appearance is multidimensional. Besides, this study had neutralized other sub-dimensions of appearance which could be interesting, such as age, race, weight (for a review see Pohl & Desrumaux, 2014) or size. For example, a study by Grant and Mizzi (2014) revealed that an overweight applicant was rated significantly higher on the obesity stereotype, significantly lower on the physical attractiveness stereotype, and significantly less employable. Regardless of attractiveness, what will become of an applicant who is obese or older? Another question relates to the stability of one's appearance. In many studies, impressions are assumed to be based on stable characteristics of faces (femininity, masculinity, symmetry…), but facial cues are probably dynamic and malleable. For example, facial cues of sleep deprivation have been shown to negatively affect perceptions of attractiveness and health (Axelsson et al., 2010). Yet, a number of more malleable characteristics have been shown to affect judgments of beauty. Facial markers such as subtle changes of mouth curvature and eyelid openness might also have important influences on perceived attractiveness and intelligence (Talamas et al., 2016). These variables may have subtle but measurable determining effects on hiring decisions.

Implications for research and practice

A future research problem will be to determine whether recruiters are aware of the probable influences of appearance on their judgments. Few studies have explored the question of the awareness of the role played by physical appearance on hiring decisions. An associated question is whether attractiveness is "subconsciously" integrated with certain qualities typical of the job or well-suited to it. Past studies have consistently shown that the gender typicality of applicants' faces affects hiring decisions for leadership positions irrespective of applicants' gender (Sczesny, Spreemann & Stahlberg, 2006). Von Stockhausen, Koeser and Sczesny (2013) found that a match between masculine or feminine facial appearance and the gender typicality of the job affected all dependent measures of hiring decisions. In line with congruity theory (Eagly & Karau, 2002) and the lack-of-fit model (Heilman, 1983), they found that employment of masculine-looking applicants for a male-typed job was more

likely than employment of feminine-looking ones, whereas feminine-looking applicants were preferred over masculine-looking ones for a female-typed job. Being aware of biasing influences is very important, and recruiters need to receive training about bias and hiring based on valid tests. Even if an attractiveness bias operates, testing could improve guidance for employers on anti-bias efforts. Indeed, the bias effect is stronger when recruiters lack certain information about applicants. Despite training programs aimed at avoiding bias, a last question concerns changes: "Will being aware of the attractiveness effect persuade recruiters to change their decision processes?". Bendick and Nunes (2012) underlined the difficulties that stigmatized groups face when attempting to mitigate the adverse effects of negative stereotypes. For example, when an individual performs in a way that is inconsistent with a stereotype, that performance gets discounted as reflecting exceptional circumstances such as luck (Swim & Sanna, 1996). Moreover, once the recruiters are convinced that it is important to have anti-bias procedures, it is difficult for them to convince partners (employers) that attractiveness is not a warranty of performance. Being fully aware of biases that may sway one's decision from choosing one applicant over another is a challenge. These biases may arise at any stage of employment, but are generally more pronounced when minimal information is known about the individual (Desrumaux & Pohl, 2014), and may be the case when investigating potential job candidates through Internet networking sites.

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Self-conception and volunteering: The mediational role of motivations

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ABSTRACT. Il volontariato ha effetti benefici sia per gli individui, dal momento che incrementa benessere e soddisfazione per la vita, sia per le comunità. È rilevante, in ogni caso, comprendere le ragioni per cui si innesca questo comportamento prosociale e per cui si continua a portarlo avanti. Questo studio esplora come alcuni concezioni centrali di sé, come l'autoefficacia generale o l'autostima, possono giocare un ruolo come antecedenti dell'impegno nel volontariato attraverso la mediazione delle differenti motivazioni connesse al volontariato. Volontari (138, di cui 69 donne) e non volontari (112, di cui 59 donne) della stessa comunità, appaiati per genere ed età, sono stati confrontati per quanto riguarda l'autostima, l'autoefficacia, le funzioni del volontariato, l'impegno nel volontariato e la soddisfazione di vita. Un modello di equazioni strutturali è stato usato per investigare le mediazioni ipotizzate. I principali risultati mostrano che l'autoefficacia è più alta tra i volontari e che le donne che fanno volontariato hanno maggior autostima delle donne che non lo fanno. L'autostima ha un'associazione negativa con l'impegno nel volontariato, con la mediazione della funzione legata alla carriera, e con l'intenzione futura, mediata dall'accrescimento di sé. L'autoefficacia gioca un ruolo nell'incoraggiare le persone a impegnarsi nel volontariato, con la mediazione della funzione valoriale nei non volontari e con la mediazione della funzione sociale nei volontari, insieme alla funzione legata all'utilizzo delle proprie conoscenze in entrambi i gruppi. La soddisfazione di vita è associata positivamente con il tempo dedicato al volontariato ogni settimana, ma non con la persistenza in questa attività, e con l'autostima. Le implicazioni possono esser rilevanti per incrementare l'impegno nel volontariato.

SUMMARY. Volunteering has beneficial effects both for individuals, as it increases wellbeing and life satisfaction, and for communities. It is relevant, however, to understand the reasons for beginning this prosocial behaviour and persisting in it. This study explores how core self-conceptions such as general self-efficacy and self-esteem may have a role as antecedents of volunteer involvement through the mediation of different motives for volunteering. Volunteers (n = 138, 69F) and non-volunteers (n = 112, 59F) from the same community, matched for gender and age, were compared on self-esteem, self-efficacy, motives, volunteer involvement, life satisfaction. A path structural model was used to investigate the hypothesized mediations. Main findings showed that self-efficacy was higher among volunteers and that women who volunteered had higher self-esteem than women who did not. Self-esteem had a negative association with the involvement of volunteers mediated by a career motive, and with future intention mediated by self-enhancement. Self-efficacy played a role in encouraging people to consider engaging in volunteering with the mediation of the values motive in non-volunteers and with the mediation of the social motive in volunteers, together with motivations linked to using one's own competences in both subsamples. Life satisfaction was positively associated with the time spent volunteering each week, but not with persistence in the service and with self-esteem. Implications may be relevant to increasing volunteer involvement.

Keywords: *Volunteering, Self-esteem, Self-efficacy, Volunteering motivations, Life satisfaction*

INTRODUCTION

Volunteering has beneficial effects both for individuals, as it increases wellbeing and life satisfaction, and for communities. Psychosocial research has studied the antecedents of this important prosocial behaviour with the aim to understand its underlying individual characteristics and motivations. Among the antecedents of volunteering, core self-conceptions seem to have a relevant role both in getting involved and persisting in voluntary activities (Barbaranelli, Caprara, Capanna & Imbimbo, 2003; Brown, Hoye & Nicholson, 2012). However, the literature has often highlighted a modest and sometimes inconsistent relationship between personal characteristics and volunteering (Callero, Howard & Piliavin, 1987; Omoto & Snyder, 1995), which may be due to intervening factors (Carlo, Okun, Knight & De Guzman, 2005).

In the present study, such intervening factors are hypothesized to be motivations to volunteering, as they may mediate the link between general self-efficacy and self-esteem and volunteer involvement and life satisfaction, which increasing evidence supports may be maintained or increased by volunteering (Brown et al., 2012; Caprara & Steca, 2005; Omoto, Snyder & Martino, 2000).

Personal characteristics of volunteers

Several studies have tried to outline the "volunteer personality". Volunteers seem to be more extroverted and sociable than non-volunteers, have greater empathic and collaborative abilities, remarkable trust in society and optimism about the future (Carlo et al., 2005; Marta & Pozzi, 2007). They also seem to have a subjective impression of competence, higher self-efficacy (Brown et al., 2012) and self-esteem (Brown et al., 2012; Kirkpatrick-Johnson, Beebe, Mortimer & Snyder, 1998; Smith & Nelson, 1975).

According to most extant literature, two main individual difference variables explain people's commitment in volunteering: self-efficacy and self-esteem. Self-efficacy is defined as an individual's self-perceived confidence to complete tasks successfully (Bandura, 1997). It has also been suggested that people with high perceived self-efficacy invest more effort and persist longer in challenging tasks (Bandura, 1997). Indeed, Barbaranelli and colleagues (2003) have proposed an extension of Omoto and Snyder's Volunteer Process Model (1995) to include perceived self-efficacy among the antecedents of volunteering, starting from Bandura's assumption (1997) that judgements on one's own self-efficacy in coping with the difficulties that may arise while volunteering affect any negative experiences or failures that such activity implies.

Self-esteem is another core self-conception studied in relation to volunteering, albeit less frequently (Brown et al., 2012; Mellor et al., 2008). Self-esteem reflects a person's overall subjective emotional evaluation of her or his own worth (Rosenberg, 1965). This perception has been shown to have an impact on self-worth protecting activities (Crocker, Brook & Villacorta, 2006), and volunteering may be one of them. Self-esteem has also been investigated as a self-motive, as people behave in ways that maintain or increase positive evaluations of the self (Cast & Burke, 2002). Finally, high self-esteem may also serve as a coping resource, in that it strengthens the person facing stressful circumstances (Taylor & Aspinwall, 1996).

However, the literature is somewhat inconsistent about the role of these two self-conceptions. The relationship between personality and volunteering has often been found to be modest or inexistent (Callero et al., 1987; Omoto & Snyder, 1995). A proposed explanation for such inconsistencies supports the greater impact of motives and situational factors over personality in determining involvement in volunteering (Callero et al., 1987). Other models try to integrate Omoto and Snyder's intuitions with those of Piliavin and colleagues, in other words, to combine dispositional and situational variables, like the Sustained Volunteerism Model (Penner & Finkelstein, 1998) and others (Chacón, Vecina, & Dávila, 2007; Davis, 2005; Marta & Pozzi, 2007; Penner & Finkelstein, 1998).

A reason for such inconsistent association may be that the relationship between personal characteristics and volunteering is mediated by intervening factors, as elsewhere suggested (Carlo et al., 2005; Davis, 2005). Davis (2005) has proposed that the impact of personality on volunteering "is often, perhaps always, mediated by intervening thoughts, feelings, and expectations. These cognitive and affective responses by the individuals are the most proximal causes of volunteer behaviour, and any effect that personality exerts is only through them".

Among the proximal causes of volunteering, motivations may be such intervening factors (Carlo et al., 2005; Davis, 2005). Personal needs and motivations play a primary role in volunteer involvement. Starting from the 1990s, models have suggested the presence of opposing dichotomous

motives: *self-oriented*, that is aiming to satisfy personal or egoistic needs, versus *other-oriented*, that is aiming to satisfy altruistic, prosocial and solidarity instances (Batson, 1987; Wilson, 2000). Rather than a dual perspective, the functional approach - traditionally developed in the attitude domain - of Omoto and Snyder's Volunteer Process Model (1995) adopts a multidimensional perspective and rests on the assumption that similar behaviours may serve different functions. Clary and colleagues (1998) have devised an instrument to measure six functions: *Values*, *Understanding*, *Career*, *Self-protective*, *Self-enhancement*, *Social*. Evidence supports the validity of each of these functions (Omoto & Snyder, 1995; Omoto et al., 2000), albeit differently from person to person and for the same person throughout the lifespan (Marta & Pozzi, 2007; Okun & Schultz, 2003).

Different self-conceptions can lead to different motives for volunteering. Although self-efficacy and self-esteem are related beliefs, both referring to a general positive self-evaluation, self-efficacy has a prospective and operative action-based connotation, while self-esteem has an emotional connotation. Because of this distinction, the expectation is that people with high self-efficacy tend to take a wider view of a task in order to determine the best plan (Bandura, 1997). Consequently, self-efficacy would be associated both with self-oriented or instrumental motives (such as career, social, understanding) and other-oriented motives (such as values). Self-esteem is related to self-worth and people with lower self-esteem may volunteer to satisfy self-oriented motives to try to improve themselves. Therefore, it would be associated with self-protective and self-enhancement motives (DeHart, Longua & Smith, 2011).

Finally, motivations influencing the decision to engage in voluntary work are different from those influencing persistence in volunteering: people's initial volunteering is determined mainly by other-oriented motivations, but having also instrumental or self-oriented motivations is functional to maintaining a long-term involvement (Capanna, Steca & Imbimbo, 2002; Davis, Hall & Meyer, 2003; Grant, 2008; Kiviniemi, Snyder & Omoto, 2002; Marta & Pozzi, 2007; Omoto & Snyder, 1995). However, a negative relationship between self-oriented motives and intention to continue, and a positive association with other-oriented motives have also been found (Penner & Filkenstein, 1998; Stukas, Hoye, Nicholson, Brown & Aisbett, 2016). The point is still controversial, probably depending on the level of emotional involvement in a specific type of activity.

Different motivations are also more beneficial to the consequences of volunteering. For instance, Stukas and colleagues (2016) found that other-oriented motives are more strongly related to wellbeing than self-oriented motives. In addition, among the individual characteristics that affect life satisfaction, several studies have identified positive correlations with general self-efficacy (Azizli, Atkinson, Baughman & Giammarco, 2015; Caprara & Steca, 2005) and self-esteem (Arslan, Hamarta & Uslu, 2010; Diener & Diener, 1995).

THE PRESENT STUDY

The primary aim of the study was to test the meditational role of motives for volunteering between general self-efficacy and self-esteem and volunteer involvement, an antecedent of life satisfaction. A second aim was to compare the dispositional and motivational antecedents of volunteer involvement in volunteers and non-volunteers of the same community, as a relevant goal for communities and volunteer organizations is to increase volunteer recruitment. First, similarly to other studies (i.e. Pearce, 1993), the personality characteristics and motivations of volunteers and non-volunteers were compared. It must be underlined that most of the data in the literature come from US research, and their generalization to European contexts need to be verified. In addition, the factors influencing recruiting and persistence in volunteer service are different (Davis et al., 2003; Grant, 2008). To identify which factors are more likely to increase willingness to begin volunteering in the future, and which may also increase volunteer involvement, it is important to understand the relative contribution of dispositions and motives as antecedents of volunteer involvement both in volunteers and in non-volunteers. Following suggestions based on previous evidence, for volunteers it is also relevant to consider separately the amount of weekly or monthly time spent volunteering and the persistence of service over time, which have different relationships with antecedents and consequences of volunteering (e.g., Finkelstein, 2008a, 2008b; Finkelstein, Penner & Brannick, 2005).

Starting from these premises, and based on previous evidence, the study hypotheses were as follows:

Hypothesis 1: self-esteem and self-efficacy were expected to influence volunteer involvement with the mediation of motives for volunteering. More specifically, and considering the different nature of these two core self-conceptions, self-

efficacy was expected to be directly associated, similarly in volunteers and non-volunteers, both to other-oriented (such as values) and instrumental (such as career, social, understanding) motives and other-oriented motives, while self-esteem was expected to be directly associated to self-relevant motives (self-enhancement and self-protective).

Hypothesis 2: among volunteers, both self- and other-oriented motives were expected to be directly related to volunteer involvement, while among non-volunteers mainly other-oriented motives were expected to be related to future intention, although evidence on this point is still controversial.

Hypothesis 3: volunteer involvement and future intention to volunteer would be directly associated with life satisfaction.

METHOD

Participants

Two subsamples: volunteers from different organizations (n = 138, 69F) and non-volunteers (n = 112, 59F). No significant differences emerged between the two samples not only as regards age (measured on 7 categories to allow the matching of the two subsamples; χ^2 (6) = 7.96, p = .24) and gender (F_{VOL} = 69, $F_{NON\text{-}VOL}$ = 59; χ^2 (1) = .57, p = .45), but also as regards educational qualifications (χ^2 (5) = 9.9, p = .07), marital status (χ^2 (5) = 7.6, p = .20), and political orientation (χ^2 (3) = 9.14, p = .18). Among the non-volunteers, 79.4% said they would do volunteering in the future.

Procedure

Referents for associations in the territory (the Valle d'Aosta Region in Northwest Italy) willingly agreed to distribute a self-administered anonymous questionnaire to their volunteers, and the response rate was high (about 90%). The 'non-volunteers' were a group of randomly chosen citizens from the same community, stratified according to the socio-demographic characteristics (age and gender) of the volunteers. They completed an adapted version of the questionnaire. The two forms of the questionnaire were identical except for a question at the beginning of the questionnaire which excluded people who were doing volunteer work or had volunteered in the past, the subsequent questions on volunteer activity/future intention to volunteers, and the conditional rephrasing of the 30 items of the *Volunteer Function Inventory* (VFI; Clary et al., 1998; e.g., VOL: "Doing volunteer work makes me feel less lonely"; NON-VOL: "Doing volunteer work could make me feel less lonely"). All participants gave their informed consent. Ethical approval was not required according to national guidelines and regulations.

Measures

General self-efficacy, measured with the Italian adaptation (Caprara, 2001) of the 20-item Perceived Self-efficacy Scale (Bandura, 1997) on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). A global index was computed averaging the items (α = .93).

Self-esteem, measured with the Italian adaptation (Prezza, Trombaccia & Armento, 1997) of the 10-item self-report unidimensional Rosenberg Self-Esteem Scale (1965) on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). A global item was computed averaging the items (α = .85).

Volunteer motives, assessed through the Italian adaptation (Capanna et al., 2002) of the 30-item Volunteer Function Inventory (VFI; Clary et al., 1998), five for each of the 6 motive subscales. Each item was rated on a 5-point Likert-type scale (from 1 = not at all important for me to 5 = extremely important for me). Averaging the relative items, 6 factors were computed: values (α = .75), understanding (α = .83), social (α = .71), career (α = .86), self-protective (α = .84), self-enhancement (α = .81).

Time spent volunteering, measured on two items: the hours volunteered per week on a 4-point Likert-type scale (1 = 1 to 2 hours per week; 2 = 3 to 4 hours per week; 3 = 4 to 6 hours per week, 4 = more than 6 hours per week), and "How often do you do volunteering?" on a 4-point response format (occasionally; only a few weeks a year; only a few months a year; all year round). A global index was computed from the average (α = .76).

Persistence of volunteer service, measured on three items: "How many years have you been a volunteer in this association?" on a 4-point Likert-type scale (1 = 0 to 1 year; 2 = 1 to 3 years; 3 = 3 to 5 years; 4 = more than 5 years); "In the past were you a volunteer for other associations?" (YES/NO); and "Are you going to continue volunteering in the

future?" (YES/NO). A global index was computed from the sum (α = .64).

Future intention to volunteer (for non-volunteers), measured on two items: "Have you ever seriously thought of doing some voluntary work?" on a 4-point response scale (1 = never; 2 = sometimes; 3 = often; 4 = very often), and "How many hours per week could you devote to volunteering?" on a 4-point Likert-type response format (1 = 1 to 2 hours; 2 = 3 to 4 hours; 3 = 4 to 6 hours; 4 = more than 6 hours). A global index was computed from the average (α = .67).

Life satisfaction, measured with the 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985), rated on a 5-point Likert-type scale (from 1 = totally false for me to 5 = totally true for me). A global index was computed averaging the items (α = .81).

Data analyses

Volunteers and non-volunteers were preliminarily compared on all the study variables. A two-way MANCOVA was performed, controlling for the effect of gender as additional independent factor and age as a covariate. Second, two separate path analyses were performed on volunteers and non-volunteers. The rationale underlying these separate analyses was that different antecedents were expected to influence beginning (intention to volunteer in the future for the non-volunteers) and persisting in volunteering (time spent and persistence for the volunteers). In the proposed models the two self-conceptions were the exogenous variables; the 6 VFI functions and volunteer involvement were the mediators; and life satisfaction was the outcome. Typically, multiple items or measures are used to assess latent variables (i.e., measurement model). In the present study, however, such an approach would have produced an unacceptably high ratio of estimated parameters compared to the sample size. Therefore, composite variables of the constructs were used as observed variables.

RESULTS

Preliminary analyses

The means, standard deviations and Pearson correlations for the study variables are reported in Table 1. A MANCOVA conducted on all the study variables revealed that the global profiles of the two groups were significantly different (Wilks' lambda = .77, $F_{(220,9)} = 7.29$, $p<.001$, $p = .094$, $\eta^2 = .23$). Examining appropriate univariate, volunteers reported significantly higher self-efficacy ($F_{(244,1)} = 7.6$, $p<.005$, $\eta^2_p = .03$). The main effect of Gender emerged for self-esteem ($F_{(241,1)} = 3.83$, $p<.05$, $\eta^2_p = .02$), qualified by a Group × Gender interaction ($F = 3.83$, $p<.05$, $\eta^2_p = .02$). A *post-hoc* 2×2 ANOVA showed that self-esteem did not differ between men and women who volunteered, whereas it was lower in women ($M = 3.7$) compared to men ($M = 4.1$) who did not volunteer.

Among volunteers and non-volunteers, the most important reason for volunteering was the values motive, followed by understanding, self-enhancement, social, self-protective, and career motives. Volunteers reported significantly greater values ($F_{(239,1)} = 8.12$, $p<.005$, $\eta^2_p = .03$) and social ($F_{(239,1)} = 10.8$, $p<.001$, $\eta^2_p = .05$) VFI motives, while the non-volunteers reported greater career motive ($F_{(239,1)} = 7.1$, $p<.01$, $\eta^2_p = .03$). Main effects of Gender highlighted that Self-protective ($F_{(234,1)} = 3.4$, $p<.05$, $\eta^2_p = .03$), Understanding ($F_{(239,1)} = .4.8$, $p<.05$, $\eta^2_p = .02$), and Values ($F_{(239,1)} = 3.7$, $p = .056$, $\eta^2_p = .02$) motives are more relevant for women (2.3 *vs* 2.1). No significant effects emerged for the Self-enhancement motive.

Finally, the volunteers reported higher life satisfaction ($F_{(241,2)} = 3.6$, $p<.05$, $\eta^2_p = .02$), with also main effects of Gender ($F_{(241,1)} = 5.5$, $p<.05$, $\eta^2_p = .02$), but it was lower in women (3.3 *vs* 3.6). As for covariate, age influenced the overall profile (Wilks' lambda = .657, $F_{(220,9)} = 12.79$, $p<.001$, $\eta^2_p = .34$). The relevance of Understanding ($r = -.19$) and Career ($r = -.35$) motives decreased with age. An effect of age also emerged for life satisfaction, which increased with age ($r = .24$).

Antecedents of volunteer involvement

Following a consolidated two-step procedure (Anderson & Gerbing, 1988), we first analysed a fully mediated saturated model, with only indirect paths between antecedents and outcome variables. Subsequently, we tested a partially mediated model adding the direct paths from self-efficacy and self-esteem to volunteer involvement and life satisfaction, and from motives to life satisfaction. These initial models were refined by carefully scrutinizing and removing non-significant paths (conventionally $t<2$), as suggested by the

Table 1 – Means, standard deviations and correlations among self-conceptions, VFI motives, involvement and life satisfaction

	Self-conceptions		Motives						Volunteer involvement			Life satisfaction		
	1	2	3	4	5	6	7	8	9	10	11	12	M	SD
1. Self-esteem	–	.47***	−.15	−.23**	.02	−.03	−.13	.08	.12	.01	.a	.39***	3.83	.60
2. Self–efficacy	.36***	–	.11	.11	.23**	.20*	.26**	.45***	.11	.04	.a	.18	3.33	.61
3. VFI career	−.07	.21*	–	.35***	.23**	.29**	.50***	.27**	.10	−.19*	.a	−.04	1.47	.69
4. VFI self-protective	−.07	.18	.45***	–	.40***	.32***	.70***	.36***	−.08	−.02	.a	−.04	2.22	.89
5. VFI values	.20*	.40***	.20*	.34***	–	.41***	.48***	.58***	.06	.03	.a	−.01	3.49	.67
6. VFI social	.04	.10	.33***	.52***	.28**	–	.44***	.26**	.03	.16*	.a	−.06	2.60	.71
7. VFI self-enhancement	.06	.29**	.48***	.78***	.44***	.43***	–	.56***	.01	−.05	.a	−.13	2.63	.85
8. VFI understanding	.16	.35***	.40***	.57***	.59***	.32***	.59***	–	.03	−.10	.a	−.11	3.33	.78
9. Time spent	.a	.a	.a	.a	.a	.a	.a	.a	–	.18*	.a	.21*	2.37	1.20
10. Persistence	.a	.a	.a	.a	.a	.a	.a	.a	.a	–	.a	−.04	2.39	.56
11. Future intention	−.02	.26**	.14	.21**	.41***	.09	.15	.44***	.a	.a	–	.a		.
12. Life satisfaction	.39***	−.02	−.02	−.13	−.07	−.04	.08	−.13	.a	.a	−.19*	–	3.55	.87
M	3.86	3.13	1.78	2.18	3.22	2.25	2.66	3.19	.		3.71	3.36		
SD	.65	.60	.70	.86	.75	.57	.81	.86	.		1.04	.85		

Note. Correlations for volunteers are reported above the diagonal; correlations for non-volunteers are reported below the diagonal.
* $p<.05$, ** $p<.01$, *** $p<.001$

Wald test. On the basis of the modification indices, the errors of the six motives were allowed to correlate; the correlated measurement errors were assumed to be due to the shared method variance.

In addition, we tested two alternative models: a non-mediated one, with self-conception and motives for volunteering free to have direct effects on volunteer involvement and life satisfaction, and one with an opposite direction of causality, with self-conceptions as outcomes and all the other variables as antecedents.

The partially mediated models yielded better overall goodness of fit than the fully mediated and the alternative models (see Table 2), considering as a comparative test that they had the highest χ^2/df ratio, as well as the lowest AIC and highest CFI. We also ran a chi-square difference test, frequently used to test differences between nested models, that is, two identical models one of which could be obtained simply by fixing/eliminating parameters in the other model. To do the test, the difference of the chi-square values of the two models and the difference of the degrees of freedom are taken. If the chi-square difference value is significant, the "larger" model with more freely estimated parameters fits the data better than the "smaller" model in which the parameters are fixed. So, it "pays off" to estimate the additional parameters and to prefer the "larger" model. Our results confirmed that the partially mediated model, with additional direct paths between the predictors and the dependent variables, fits the data better than the fully mediated model (χ^2 difference for volunteers 30.9(2), $p<.001$; non-volunteers 23.2(2), $p<.001$).

The partially mediated models are presented graphically in Figure 1 for the volunteers and in Figure 2 for the non-volunteers. Comparing the two models, the ensuing estimated paths remained significant and of comparable strength in both subsamples: self-esteem directly to life satisfaction ($\beta = .44$ and .42, respectively; the direct paths from self-efficacy did not produce significant betas); self-esteem to self-enhancement, although negatively in the volunteers ($\beta = -.16$), and positively in the non-volunteers ($\beta = .10$); self-efficacy to values ($\beta = .20$ and .32) and to understanding ($\beta = .37$ and .30) motives. Therefore, our first hypothesis on the mediational role of motives between self-conception and volunteer involvement has been confirmed. In line with our expectations, in both subsamples self-efficacy has a direct relationship with both other-oriented (values) and instrumental (understanding) motives, while self-esteem has a direct relationship with a self-relevant motive (self-enhancement).

Among the volunteers, besides the common and already mentioned effect on self-enhancement, self-esteem has also a direct negative association with self-protective ($\beta = -.15$) and career ($\beta = -.15$) motives. Besides the effect on understanding, self-efficacy has a direct association with self-enhancement ($\beta = .12$) and social ($\beta = .16$) motives. These associations are in line with our expectations.

Our second hypothesis was that, among volunteers, both self- and other-oriented motives would be directly related to volunteer involvement, but the structural model supports this hypothesis only for self-oriented motives: career has an opposite effect on time spent ($\beta = .25$) and persistence ($\beta = -.26$), while understanding ($\beta = .23$) and social ($\beta = .33$) motives have a direct positive association with persistence ($\beta = .23$). Among non-volunteers mainly self-oriented motives were expected to be related to future intention, and the values ($\beta = .26$) motive is actually associated with future intention to start volunteering. In addition to our expectations, also understanding ($\beta = .41$) and self-enhancement (negatively, $\beta = -.19$) motives are associated with future intention.

Finally, time spent volunteering - but not persistence in the service - has a direct positive effect ($\beta = .20$) on life satisfaction, while future intention has a significant negative association with life satisfaction ($\beta = -.20$) (thus confirming Hypothesis 3). In addition to our expectations, the understanding motive has a direct negative effect on life satisfaction ($\beta = -.20$) in volunteers.

Discussion

The aim of the study was twofold: first, to compare antecedents of volunteer involvement in volunteers and non-volunteers of the same community; second, and foremost, to examine the mediational role of motivations to volunteering between self-efficacy/self-esteem and volunteer involvement.

Self-efficacy turned out to be higher among volunteers, as previously observed (e.g., Caprara & Steca, 2007), while self-esteem, elsewhere found to be higher in volunteers (e.g., Brown et al., 2012), here was higher only in women volunteers. Volunteering, then, seems to have a self-protective effect in filling the gender gap in women's self-image (Kling, Hyde, Showers & Buswell, 1999). Concerning the relative importance of each motivation for volunteering, our findings exactly replicate prior research (e.g., Okun & Schultz, 2003; Stukas et al., 2016). The more relevant role of career and understanding

Table 2 – Goodness-of-fit for rival models

Models	χ^2	χ^2/df	CFI	RMSEA	AIC
Volunteers					
M1 Fully mediated	61.5(27) p<.001	2.3	.91	.098	334
M2 Partially mediated	30.6(25) ns	1.2	.99	.041	307
M3 Non-mediated	33.2(21) p<.05	1.6	.97	.063	1161
M4 Alternative causality	90.9(21) p<.001	4.3	.86	.11	1194
Non-volunteers					
M1 Fully mediated	48.4(23) p<.005	2.1	.92	.099	252
M2 Partially mediated	25.2(21) ns	1.2	.99	.042	232
M3 Non-mediated	15.8(13) ns	1.2	.99	.044	239
M4 Alternative causality	43.7(25) p<.01	1.7	.94	.082	243

Legenda. df = degree of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; AIC = Akaike Information Criterion.

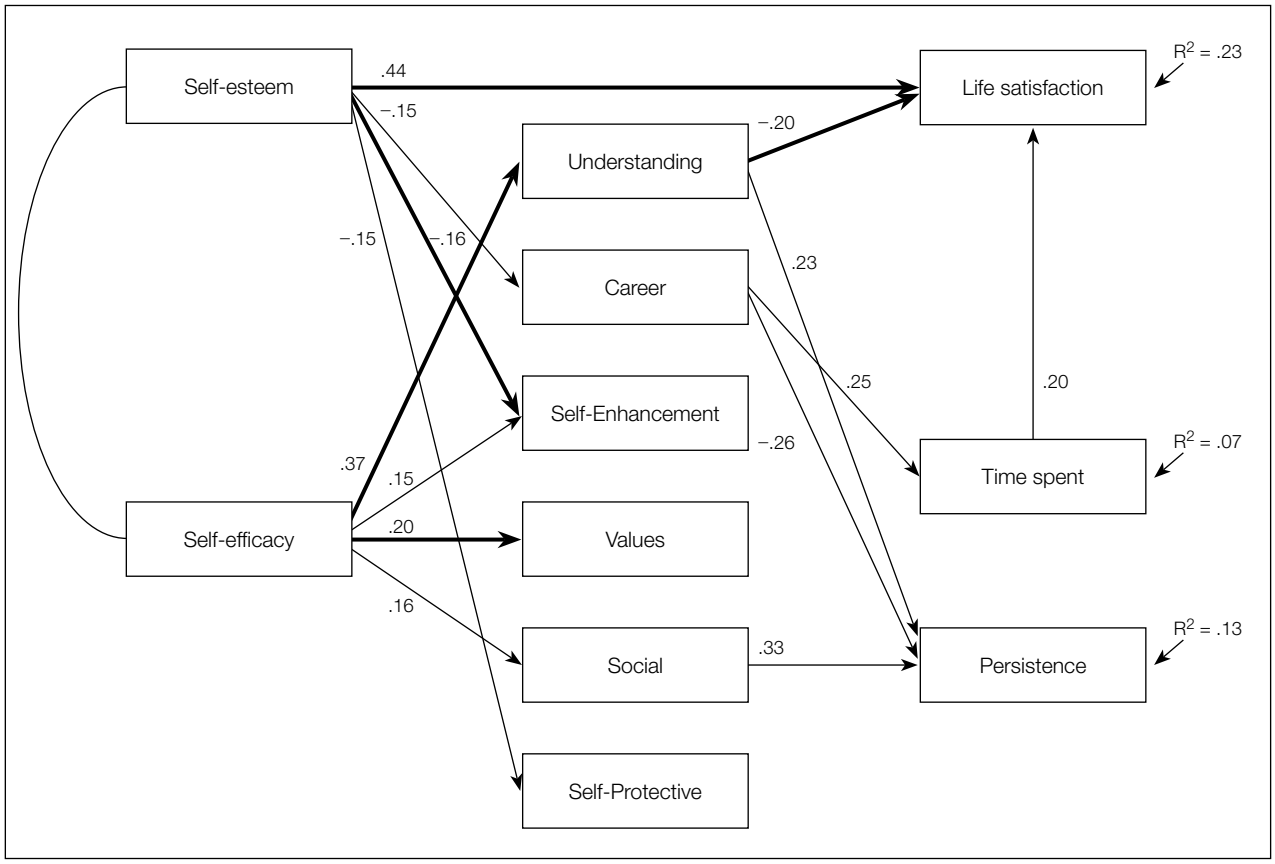
Note: Goodness-of-fit was evaluated by the inspection of χ^2 (non-significant *p*-values indicate a good fit); χ^2/df (less than 2, and lower values indicated a better fit); CFI (values greater than .95 indicate a good fit); RMSEA (values of .05 or less indicate a good fit); AIC to compare alternative models (smaller values indicate better adjustment).

motives in younger people has also been confirmed, while the social motive has not been proven more relevant in older people, as previously found (Caprara & Steca, 2005; Okun & Schultz, 2003). Earlier evidence on gender differences, often small or not detected (Burns, Reid, Toncar, Anderson & Wells, 2008; Kirkpatrick-Johnson et al., 1998; Wilson, 2000), is more contradictory. Our findings support the prevalence of altruistic motives among women and suggest that women volunteers wish to use their skills and acquire new ones and are driven by an ego-defensive motivation more than men, while, in line with previous results (Burns et al., 2008; Stukas et al., 2016), no differences emerge in social motives.

We found evidence of the mediating role of motivations to volunteering between self-conceptions and volunteer involvement, thus confirming our main hypothesis. Motivations fully mediated the link between self-efficacy and volunteering involvement in volunteers. In non-volunteers we found a positive mediated association through understanding and social motives with persistence and time spent, and through values motive and understanding with future intention to volunteer. Self-esteem had a positive mediated association with persistence and a negative mediated association with time spent through the career motive among the volunteers, and a negative mediated association through self-enhancement with future intention. These results extend previous findings on the different relationships of motives with time spent and persistence in volunteering, for instance with the opposite association of career motive (Finkelstein, 2008a; Finkelstein et al., 2005; Penner & Finkelstein, 1998)

In line with our expectations, both self-esteem and self-efficacy are reliably associated with the expected volunteer motives. Self-efficacy has a wider influence on

Figure 1 – Volunteers: path analysis of antecedents of volunteer involvement and life satisfaction



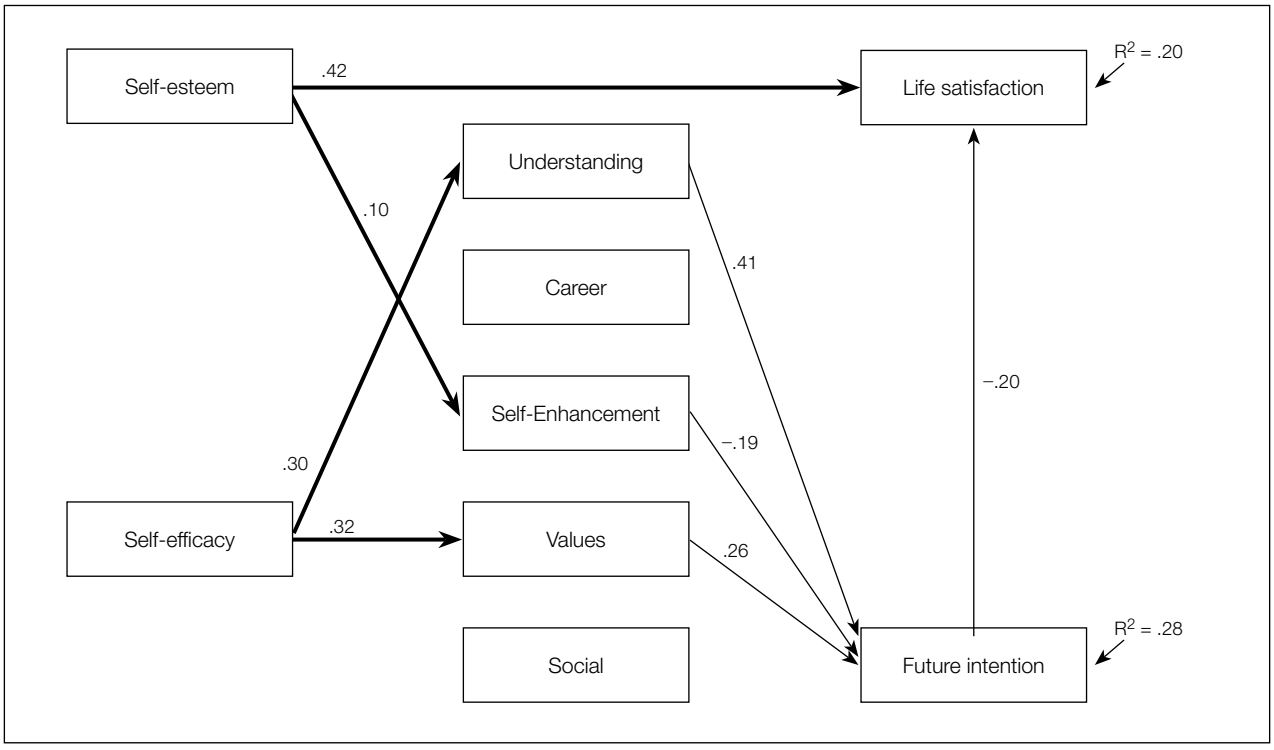
Note: Only significant paths are reported (T>2, p<.05). Coefficients are standardized betas. Curved lines indicate error covariances, not reported among all the VFI motive functions for clarity of the graph. Bold lines indicate common paths between the two subsamples.

the motivational process, as it is positively associated with several both self-oriented and instrumental motives. As expected, self-esteem is negatively associated with self-protective and self-enhancement motives and, in addition to our expectations, with career motivation in volunteers - actually highly correlated with self-enhancement. People with a positive self-image do not see any reason to volunteer to improve themselves. On the contrary, in the non-volunteers self-esteem was positively associated with the self-enhancement motive.

Previous evidence is controversial about the relationships between other- or self-oriented motives for volunteering and involvement or intention to start volunteering (Capanna et al., 2002; Davis et al., 2003; Grant, 2008; Kiviniemi et al., 2002; Marta & Pozzi, 2007; Omoto & Snyder, 1995; Penner & Filkenstein, 1998; Stukas et al., 2016). Our findings do not support that mainly other-oriented motives are related to future intentions (Hypothesis 2), as they highlight the relevance also of self-oriented motives such as self-enhancement and understanding. On the other hand, the involvement of volunteers - particularly persistence in the service - is related only to self-oriented motives such as social and career motives.

Finally, as hypothesized, motives for volunteering had no direct association with life satisfaction in both subsamples, with the exception of the understanding motive in volunteers. The desire to profitably make use of knowledge and skills, learn more about other people and the world is in itself a

Figure 2 – Non-volunteers: path analysis of antecedents of volunteer involvement and life satisfaction



Note: Only significant paths are reported (T>2, p<.05). Coefficients are standardized betas. Curved lines indicate error covariances, not reported among all the VFI motive functions for clarity of the graph. Bold lines indicate common paths between the two subsamples.

motivation negatively related to life satisfaction. In both samples self-esteem has also a direct relationship with life satisfaction. Life satisfaction is a multidimensional construct, influenced not only by activities such as volunteering. Diener and Diener (1995) found a correlation of .47 between self-esteem and life satisfaction in college students from several cultures; a high correlation, confirmed in our study (.39), which can explain its direct association.

This work has some limitations. First, due to its correlational and cross-sectional design, it is not possible to determine the direction of causality, so we cannot exclude the existence of bidirectional causality, with volunteering leading to higher levels of self-esteem and self-efficacy. However, a longitudinal study on the benefits of volunteering among adolescents (Kirkpatrick-Johnson et al., 1998) supports our interpretation of their indirect influence on involvement with the mediation of motives: a dispositional variable such as academic self-esteem appeared to be a reason for choosing to take up volunteering, but was not itself influenced by volunteer experience. Even more problematic is the direction of causality between volunteer involvement and life satisfaction. As Finkelstein (2008b) remarks, we do not know whether satisfied volunteers spend more time helping or whether more time spent helping leads to increased satisfaction. If, on the one hand, it seems true that volunteering increases subjective wellbeing and life satisfaction, on the other, Thoits and Hewitt (2001) have observed that people who do volunteer work enjoy good physical health. And so the age-old issue comes up again: is it volunteering that favours people's wellbeing or is it that people already enjoying a certain level of wellbeing tend to get involved in volunteering? Very likely, both things are true. Even if we tested models with the alternative direction of causality, and the resulting goodness-of-fit supported our hypotheses, confirmation from longitudinal studies is

needed. In any case, our findings offer a suggestion to this controversial issue as they highlight a negative, albeit modest, correlation between future intention to volunteer and life satisfaction.

A second limitation is that we conditionally measured the motives among non-volunteers in terms of hypothetical volunteering, while we measured the "actual" motives among volunteers. An intention measure involves a different process of thought and action and it may be problematic to compare potential with real motivations. We are partly reassured by the fact that motives show a similar pattern of inter-correlations in both subsamples, replicating prior evidence (Clary & Snyder, 2002; Okun & Schultz, 2003).

These limitations notwithstanding, the findings of our field study allow us to conclude that the way people think of themselves influence volunteering in several ways. Self-efficacy may sustain the persistent involvement of volunteers with the mediation of both instrumental and self-oriented motivations, and may play a role in encouraging people to get actively involved in volunteer work with the mediation of the other-oriented values motive, in line with previous evidence on its greater influence on future or new volunteers (Omoto & Snyder, 1995). Self-esteem may, on the contrary, exert a negative influence on volunteer involvement, through the mediation of the career motive in the volunteers and self-enhancement in the non-volunteers. Volunteering, although only the time spent weekly in the service and not persistence in it, also confirms its potential positive effect on life satisfaction, higher in volunteers, lower in women, and increasing with age, as often highlighted in the literature (Kling et al., 1999; Orth, Trzesniewski & Robins, 2010). Future intention to volunteer has, on the contrary, a moderately negative relationship with life satisfaction. The relationships between considering taking up volunteering in the future and life satisfaction may be bidirectional, with dissatisfied people being more prone to consider volunteering to increase their life satisfaction. This can certainly be an interesting issue for future research.

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Assessing patient-centeredness among medical students: The Italian translation and validation of the Patient-Practitioner Orientation Scale

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ABSTRACT. Il presente studio ha lo scopo di valutare le proprietà psicometriche della Patient-Practitioner Orientation Scale (PPOS) in un ampio campione (N = 854) di studenti di medicina italiani iscritti al secondo anno di corso, dei sei anni accademici consecutivi. I 18 item della PPOS sono stati tradotti in italiano mediante un processo di traduzione standard/back-translation. Il modello di misurazione della PPOS è stato testato attraverso una serie di analisi fattoriali confermative. È stata calcolata anche la misurazione dell'invarianza multi-gruppo tra maschi e femmine. Infine, validità convergente e composite reliability di Raykov sono state adottate come indicatori della consistenza interna della PPOS. I risultati supportano i due fattori originali denominati Caring e Sharing, ma la versione italiana della PPOS prevede solo 8 dei 18 item del questionario originale. La PPOS-8-IT ha dimostrato di essere uno strumento di autovalutazione valido ed affidabile per misurare l'approccio centrato sul paziente degli studenti di medicina italiani. La PPOS-8-IT potrebbe essere utilizzata al fine di valutare e monitorare nel tempo l'atteggiamento degli studenti di medicina italiani nei confronti della relazione medico-paziente per scopi formativi, valutativi e di ricerca.

SUMMARY. This study aimed to evaluate the psychometric proprieties of the Italian version of the Patient-Practitioner Orientation Scale (PPOS) in a large sample (N = 854) of Italian second-year medical students from six consecutive academic years. The 18 items of the PPOS were translated into Italian using a standard translation/back-translation process. The construct validity of the PPOS was established with Confirmatory Factor Analyses. Multi-group measurement invariance between males and females was also performed. Finally, convergent validity and Raykov's composite reliability were used as indicators of PPOS internal consistency. Results supported the two original factors labeled Caring and Sharing, but the validated Italian version of the PPOS includes 8 items out of the 18 of the original questionnaire. The PPOS-8-IT resulted in a reliable and valid self-report measure of patient-centeredness among Italian undergraduate medical students. The PPOS-8-IT might be used for assessing and monitoring the attitudes of Italian medical students towards the doctor-patient relationship for educational, evaluative, and research purposes.

Keywords: *Confirmatory Factor Analysis, Convergent Validity, Internal Consistency*

INTRODUCTION

Contemporary medicine is characterized by two paradigms: biomedical *evidence-based medicine* and bio-psycho-social *patient-centered medicine* (Bensing, 2000). In the health field, the bio-psycho-social perspective led to the transition from a doctor-centered medicine to a medicine centered on the patient and a more egalitarian doctor-patient relationship. In this theoretical framework, healthcare professionals have to face not only the patients' disease with their technical knowledge (to *cure*), but they are also asked to deal with the patients' human needs of warm, comprehension, and attachment (to *care*) (De Valck, Bensing, Bruynooghe & Batenburg, 2001). The patient takes the role of a partner along a shared process of information (Thorne, Oliffe & Stajduhar, 2013), power and treatment decisions (Kaba & Sooriakumaran, 2007).

The patient-centered approach to treatment is associated with high levels of patient satisfaction (Chan & Azman, 2012) adherence (Cvengros, Christensen, Hillis & Rosenthal, 2007), treatment compliance (Robinson, Callister, Berry & Dearing, 2008), empathic therapeutic relationship (Pinto et al., 2012), physical health of different patient groups (de Boer, Delnoij & Rademakers, 2013) and change in their lifestyle (Epstein, 2005). It has been also shown that the patient-centered medicine decreases the health care costs (Mead & Bower, 2002) and benefits the health professionals reducing the levels of work-related stress, burnout syndrome (Nelson et al., 2014), complaints and litigations (Fallowfield, 2008).

The growing interest in the psycho-social aspects of medicine has led researchers to develop numerous instruments in order to evaluate the patient-centered attitude, such as the Patient Reaction Assessment (Galassi, Schanberg & Ware, 1992), the Patient Perception of Patient Centeredness (Stewart et al., 2000), the Consultation Care Measure (Little et al., 2001), the Perceived Involvement in Care Scale (Smith, Winkel, Egert, Diaz-Wionczek & DuHamel, 2006), and the Component of Primary Care Instrument (Malouin, Starfield & Sepulveda, 2009).

Over other instruments, the *Patient-Practitioner Orientation Scale* (*PPOS*) has the benefit of evaluating the *caring* and the *sharing* attitudes of students, physicians and other healthcare professionals providing the same questionnaire (Trapp & Stern, 2013). The original version of PPOS (Krupat, Hiam, Fleming & Freeman, 1999), tested with a sample of medical students at first year, contained 35 items reduced to 20 items after the statistical analyses. This preliminary study found good psychometric characteristics of the instrument with an overall alpha level of .89 (*Caring* subscale $\alpha = .84$, and *Sharing* subscale $\alpha = .85$).

The current version of PPOS (Krupat et al., 2000), tested with a sample of undergraduate psychological students, was reduced from 20 to 18 items, but the factors (*Caring* and *Sharing*) were confirmed. In addition to the *Caring* and *Sharing* scores obtained with the mean of the nine items in each dimension, the mean of all items represents a *Total* score ranging from 1 (respondent has a doctor-centered or paternalistic disposition) to 6 (respondent has a patient-centered or egalitarian disposition). The initial validation studies tested the internal consistency of the questionnaire and found adequate reliability ranging from .73 to .88 (Haidet et al., 2001; Krupat, Bell, Kravitz, Thom & Azari, 2001; Krupat et al., 2000). Although there are not any formal validation studies that tested the predictive and convergent validity of the PPOS, in the literature there are several research works that compared PPOS scores to relevant clinical outcomes. PPOS has been associated to patients' satisfaction and trust (Krupat et al., 2001; Krupat et al., 2000), to effective communication in medical encounters (Street, Krupat, Bell, Kravitz & Haidet, 2003), and increased patient engagement (Shaw, Woiszwillo & Krupat, 2012). Moreover, the patient-centered orientation during doctor-patient communication has been found positively correlated with self-reported empathy among medical students (LaNoue & Roter, 2018).

Considering the importance of patient-centeredness and its clinical advantages, the PPOS has been translated and validated into several languages worldwide (Grilo, Santos Rita, Carolino, Gomes & dos Santos, 2018; Mudiyanse, Pallegama, Jayalath, Dharmaratne & Krupat, 2015; Paul-Savoie, Bourgault, Gosselin, Potvin & Lafrenaye, 2015; Pereira et al., 2013). In Italy, to our knowledge, there are only some qualitative studies regarding the patient-centeredness (Lamiani, Leone, Meyer & Moja, 2011). This study aimed to verify the psychometric characteristics of the Italian version of the PPOS.

METHOD

Measures

– *Patient-Practitioner Orientation Scale (PPOS)*

This self-report questionnaire is composed of 18 items rated on a six-point Likert scale (from "strongly agree" to "strongly

disagree"). It was developed to evaluate two dimensions of patient-centeredness, named respectively *Caring* and *Sharing* (Krupat et al., 2000). The *Caring* dimension (8 items) refers to the respondent's belief regarding the importance for practitioners to consider patients as a whole (emotions, fears, interests, and beliefs) rather than only a disease. High levels of *Caring* mean that the respondent believes in a holistic and supporting approach. The *Sharing* dimension (8 items) reflects the respondent's perception regarding the possibility that power, information, and control should be shared between the patient (expert of him/herself) and the physician (expert of medicine). High levels of *Sharing* highlight that the respondent believes that the patient-physician relationship should be egalitarian.

– *Interpersonal Reactivity Index (IRI)*

Empathy was measured using two out of the four subscales of the Italian validated version of the Interpersonal Reactivity Index (IRI) (Albiero, Ingoglia & Lo Coco, 2006; Davis, 1980). Respondents are asked to indicate how much each item describes them on a 5-point Likert scale ranging from 0 ("does not describe me well") to 4 ("describes me very well"). The two IRI subscales included in the present study were: (1) the *Empathic Concern* (EC) which quantifies the emotional side of empathy and assesses feelings of compassion and concern for misfortunes of other people, and (2) the *Perspective Taking* (PT) which evaluates the cognitive domain of empathy and measures the spontaneous propensity to adopt the psychological point of view of other people. In this study, the Cronbach's alpha values for EC and PT subscales were, respectively, .74 and .81.

Translation

In order to develop the Italian version of the PPOS questionnaire, authors have obtained from the original author permission to translate and develop the instrument in the Italian context. The 18 items of the PPOS scale were translated and adapted using a standard translation/back-translation process (Brislin, 1986). First, the PPOS items were translated into Italian. A second translator, blind to the original English items, back-translated the Italian version into English. Bilingual fluency was required by both translators. The English back-translation was then compared to the original. If the items did not coincide, a second translation was made and then translated again by the second translator until translations overlapped. After a pilot administration of the scale to five Italian medical students, minor changes were implemented to maximize the comprehensibility of the items.

Procedure

Students were recruited on campus after class, adopting a convenience sampling method. A set of paper-and-pencil questionnaires was administered at the beginning of each second course year. Participation was voluntary, and informed consent was signed by all individual participants included in the study before the beginning of the questionnaires' compilation. The questionnaires' administration took place in the classroom and took nearly 30 minutes to complete. A researcher was always on hand to answer questions. This research was previously approved by the university ethical committee.

Strategy of data analyses

The strategy of data analyses was based on standard procedures for instrument development (Veronese & Pepe, 2017) based on Confirmatory Factor Analysis (CFA). CFA is a data analysis technique that provides both numerical support and practical information about the construct validity of a given quantitative model of measurement. As suggested by Judd, Jessor and Donovan (1986)all rights reserved, the assumption of uni-dimensionality (M_1, all items loading on a single latent factor) of underlying constructs was initially tested. Then, the original factor structure of PPOS (M_2; Krupat et al., 2000) was tested in order to assess its degree of fit with empirical data. Such an attempt was made in order to assess discriminant validity and to compare goodness-of-fit indexes of a single-factor model of measurement with a nested comparison model consisting of all the instrument's features.

As usual, in the framework of CFA, absolute, and relative fit indexes comparing reproduced co-variance matrix with empirical data were adopted. The following indexes were evaluated: χ^2, Normed-Chi Square (NC), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). Model fit was considered robust

if NC<2.0, RMSEA<.08, CFI and TLI>.95 (Morin, Marsh & Nagengast, 2013).

In order to provide additional information about the ecological validity of the Italian resulting version of PPOS, the best fitting model supported by CFA was taken as the baseline model of measurement for testing factorial invariance across gender. Measurement invariance between male and female students would imply that the relations among underlying dimensions and observed variables did not significantly vary as a function of gender (Pepe, Addimando & Veronese, 2017; Veronese & Pepe, 2013). The gender groups were selected for comparison because they were expected to differ about levels of patient-centeredness (Wahlqvist, Gunnarsson, Dahlgren & Nordgren, 2010). If the quantitative model of measurement was found to cover the same constructs in males and females, this would provide further evidence for justifying confidence in generalizing results across groups.

To this end, four levels of invariance (configural invariance, metric invariance, strong invariance, and full construct invariance) were assessed using Multi-Group Confirmatory Analysis (MGCFA). Measurement equivalence across gender groups was rejected if the $\Delta\chi^2$ between the two models (baseline *vs* nested model) was statistically significant. For the other fit indexes (ΔCFI, ΔRMSEA, ΔTLI), the parameter for rejecting invariance was set at Δ>.01, corresponding to a *p* level of .01 (Chen, 2007).

Finally, the factor structure of PPOS was reported for reliability evaluation via composite reliability (Raykov, 1997) and inter-class correlation coefficient (Shrout & Fleiss, 1979). Finally, convergent validity between PPOS scores and IRI scores was tested.

Preliminary exploration of the data included testing distribution assumptions (asymmetry and kurtosis values were required to fall within the range −1, +1) and checking for multivariate outliers (Mahalanobis' distance was set at $p<.001$). Neither uni- nor multi-variate outliers were found. All scores reported distribution values within the suggested threshold for normality.

RESULTS

Study sample

This study enrolled a total of 900 second-year medical students from six consecutive academic years (from 2010/2011 to 2015/2016) at one Medical School in Northern Italy. 854 students completed all the questionnaires (response rate = 94.8%). The analyzed sample included 408 (47.8%) males and 446 (52.2%) females and aged from 18 to 33 years ($M = 19.93$, $SD = 1.39$). All participants were Italian.

Confirmatory Factor Analyses (CFA)

First, the uni-dimensionality of the model (M_1) was tested. The analysis of goodness of fit indexes revealed a general poor fit of the model with the empirical data [χ^2 (19) = 83.6, $p<.001$, NC = 4.18, NFI = .689, NNFI = .630, CFI = .735, RMSEA = .092, $p<.001$] and suggested to reject the one latent dimension model. Then, the original bi-dimensional model of measurement (M_2; as reported by Krupat et al., 2000) was tested. Results of CFA revealed a poor fit of the model [χ^2 (125) = 316.6, $p<.001$, NC = 2.53, NFI = .740, NNFI = .779, CFI = .820, RMSEA = .045, $p = .902$] with different indexes below the recommended cut-off point for acceptance. Analysis of resulting statistics (in particular item factor loadings) revealed that many different items reported associations with the respective latent factor below the recommended values (λ<.3) (see Figure 1).

Consequently, a third CFA (M_2a) was performed retaining only items satisfying statistical criteria and two latent factors (*Caring* and *Sharing*). The analysis of statistical indexes of M_2a suggested the acceptance of the factor structure: χ^2 (125) = 316.6, $p<.001$, NC = 2.53, NFI = .740, NNFI = .779, CFI = .820, RMSEA = .045, $p = .902$. In particular, the saturation values were medium-high (ranging from λ= .42 to λ = .68) and three item-level errors were correlated (see Figure 2).

The key finding of MGCFA (see Table 1) was that the model of measurement of the 8-item Italian version of the PPOS (PPOS-8-IT) should be considered as invariant between male and female students only in relation to configural and metric invariance. This means that both groups share the same pattern of fixed saturation loadings and intercept values, but no other type of model constraints or equivalence. In other words, respondents did not attribute the same meaning to the latent constructs as well as the meaning of underlying items. All in all, the results indicated weak measurement invariance, suggesting caution in drawing inferences from differences in latent means and sum scores between gender-based groups (Byrne, Shavelson & Muthén, 1989).

Reliability, convergent validity, and descriptive statistics

Raykov's composite reliability (Raykov, 1997) was used as the indicator of PPOS-8-IT scales' internal consistency and reliability. It represents a valid alternative to common Cronbach's α, especially because it is not based on the assumption of Tau equivalence (i.e., all loadings were set equal in the model with uncorrelated errors). Also, the intraclass correlation coefficient (ICC) was reported. Reliability was considered poor if the ICC value was lower than .4, or the correlation was not statistically significant (p<.05). Results, along with descriptive statistics, are reported in Table 2, and they support the empirical adoption of the PPOS-8-IT.

Convergent validity analysis was performed by calculating Pearson's zero-order correlation coefficients between PPOS-8-IT and IRI scores (see Table 3). Both *Caring* and *Sharing* positively correlated with EC, whereas only *Caring* was significantly correlated with PT.

Figure 1 – Results of confirmatory factor analysis of the original model of measurement of PPOS (M_2)

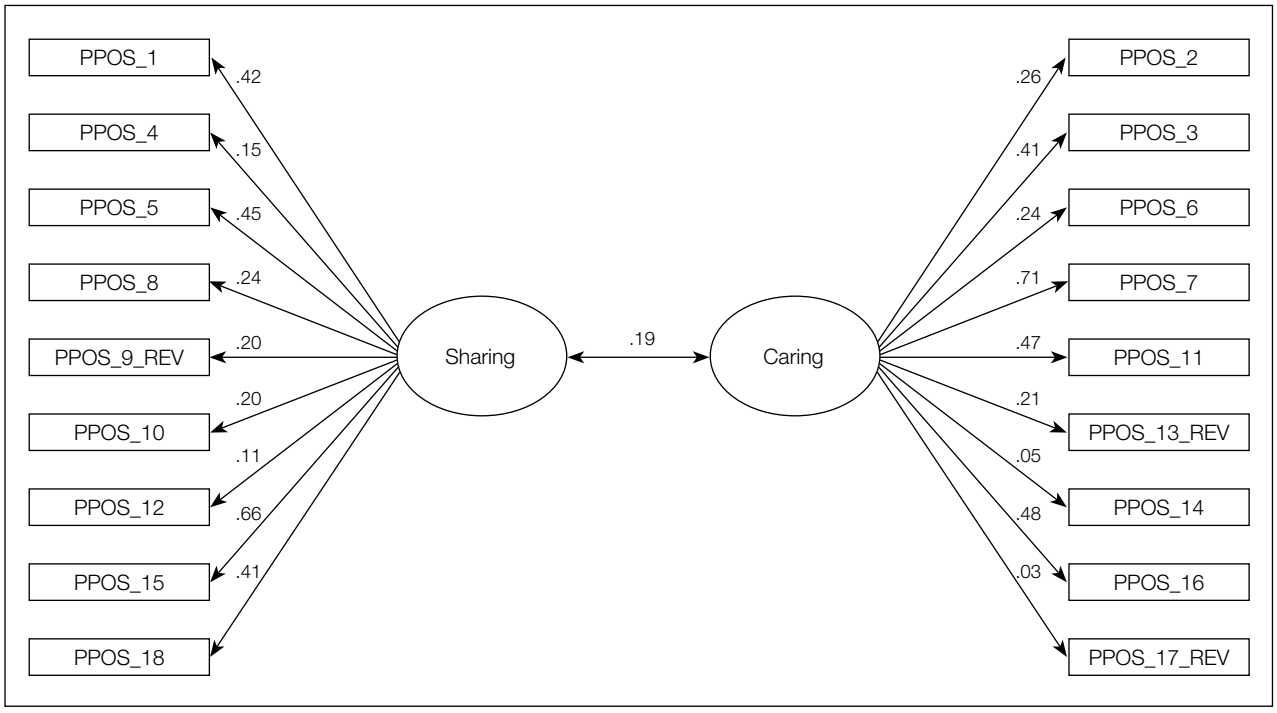

Figure 2 – Results of confirmatory factor analysis of final model of measurement of PPOS (M_2a)

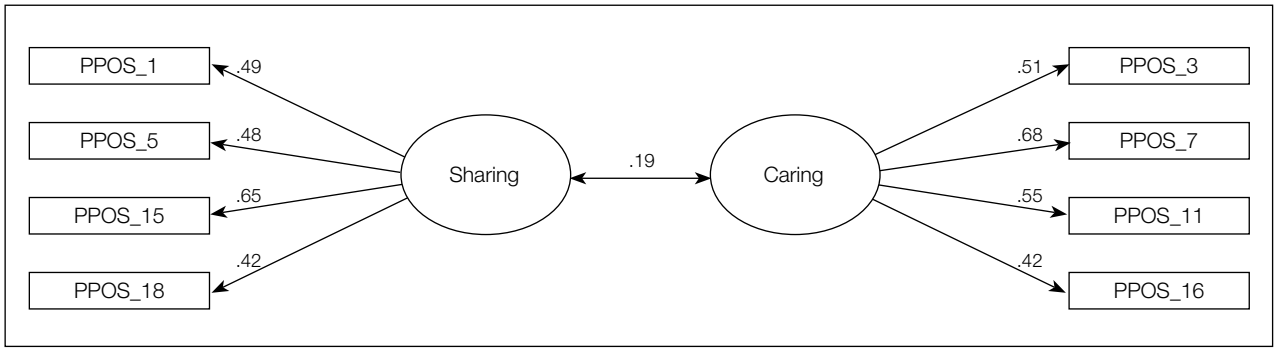

Table 1 – Multigroup CFA of PPOS-8-IT structure on the full sample (N = 854): model invariance between male and female. Only configural invariance was supported

	χ^2	df	p	$\Delta\chi^2$ (p)	ΔRMSEA	ΔCFI	ΔNNFI	AIC
Configural invariance	49.8	32	.023	–	.027	.966	.967	161.8
Metric invariance	75.2	44	.002	7.96 (.241)	.001	.008	.009	157.8
Scalar invariance	161.3	52	.001	86.1 (.001)	.026	.154	.141	222.5
Residual invariance	177.3	55	.001	16.1 (.001)	.001	.163	.134	221.6
Full invariance	291.5	63	.001	114.2 (.001)	.003	.375	.397	322.1

Legenda. df = degree of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; NNFI = Non-Normed Fit Index; AIC = Akaike Information Criterion.

Table 2 – Demographic characteristics and psychometric proprieties of PPOS-8-IT Caring and Sharing scores

		Caring				Sharing			
Variable	**%**	**M**	**SD**	**Skewness**	**Cp (ICC)**	**M**	**SD**	**Skewness**	**Cp (ICC)**
Overall	100%	4.65	.75	−.75	.71 (.58)	3.29	.87	−.042	.68 (.54)
Gender									
Male	47.8%	4.43	.80	−.61		3.12	.87	.11	
Female	52.2%	4.87	.65	−.71		3.45	.85	.01	
Age (years)									
19 or less	37.9%	4.46	.78	−.67		3.01	.88	.221	
20	43.5%	4.76	.69	−.88		3.41	.85	−.136	
21 or more	19.6%	4.77	.72	−.73		3.33	.33	−.195	

Note. Cp = Composite Reliability; ICC = Intraclass Correlation Coefficient; cut-off points for skewness [−2; +2; George & Mallery, 2010].

Table 3 – Pearson's zero-order correlations between PPOS-8-IT and IRI subscales: the convergent validity was confirmed

Variable	1	2	3	4
1. Caring	1	.300[a]	.343[a]	.170[a]
2. Sharing		1	.094[b]	.067
3. EC			1	.258[a]
4. PT				1

Note. Caring = PPOS-8-IT Caring; Sharing = PPOS-8-IT Sharing; EC = IRI Empathic Concern; PT = IRI Perspective Taking; [a] $p<.001$; [b] $p<.01$.

DISCUSSION

This study aimed at translating and validating the Italian version of the Patient-Practitioner Orientation Scale (PPOS) (Krupat et al., 2000) and at exploring its dimensionality in a large group of Italian undergraduate medical students. The need for a systematic test of the psychometric property of the PPOS is due to the lack of reports of this kind of data in the Italian context to date.

The results of this study provide evidence for a robust, reliable, and valid questionnaire, loading onto the two original factors (labeled *Caring* and *Sharing*). However, the version of the instrument developed in this study counts eight items, ten items less than the original questionnaire. The ten items were excluded for empirical and numerical reasons. Our results show that the PPOS-8-IT is composed of two subscales each made by four items, confirming the original *Caring* and *Sharing* factors. Previous studies have already shown some difficulties in confirming good psychometric properties of the original 18-item PPOS. A German validation (Kiessling, Fabry, Fischer, Steiner & Langewitz, 2013) proposed a 12-item version, while a Chinese validation advanced an 11-item solution (Wang et al., 2017). However, in both validation studies the two-factor structure of the questionnaire was confirmed. Comparing our data with the literature, our respondents obtained a similar pattern of those from abroad, showing higher scores in *Caring* than in *Sharing* (Krupat et al., 1999; Moore, 2008; Mudiyanse et al., 2015; Ribeiro, Krupat & Amaral, 2007; Tsimtsiou et al., 2007). This result supports the construct validity of the PPOS-8-IT.

In order to evaluate the convergent validity of PPOS-8-IT we have explored its correlation with the Interpersonal Reactivity Index (IRI) (Davis, 1980). The IRI is a multidimensional measure of empathy widely used in the medical education context (Hemmerdinger, Stoddart & Lilford, 2007) that was found highly correlated to other self-reported measures of empathy specifically developed for health students and professionals (Hojat, Mangione, Kane & Gonnella, 2005). The present study confirms the empirical relationship between patient-centered orientation and empathy attitude. Our results show that students who

are more concerned about others' feelings (emotional side of empathy) and who tend to take into consideration others' perspectives (cognitive side of empathy) are more prone to take care of the emotional needs of patients during clinical encounters. On the contrary, only the preoccupation for unfortunate others (emotional side of empathy) significantly and positively correlates with the students' attitude to consider important sharing clinical information with the patient.

In literature, patient-centeredness and empathy have been found related from both theoretical and empirical viewpoints. Empathy in clinical practice has been defined as the basis of the caring and sharing attitudes highlighted by the patient-centered approach that recognizes the patient as a whole person rather than an organic disease (Hojat, 2007; Mudiyanse, 2016). Shaw and colleagues (2012) found that scoring high in PPOS was associated with asking more questions about patients' lifestyle, providing more lifestyle advice, and more attempts at rapport-building.

Limitations

There are several limitations to our study. Lack of a divergent measure and the use of a self-report instrument to test the convergent validity are the two main limitations of this study. Objective examinations and observations of study participants' behaviours during the clinical encounters with real or simulated patients could be considered to further examine the validity of the PPOS-8-IT. Furthermore, although this study involved a large sample of Italian undergraduate medical students, our findings may not be generalized to all Italian healthcare students and professionals as our sampling population was limited to students enrolled in the second year of medical school. A replication of this study should include patients, practitioners and medical students at different stage in their educational path and from other Italian medical and healthcare institutions.

CONCLUSION

The Italian 8-item version of the PPOS has demonstrated acceptable validity and adequate reliability. In conclusion, medical educators might use the PPOS-8-IT to promote curricula and teachings in which medical students could develop the competences in patient-centered care (e.g. communicational skills, professional values, and humanism) alongside clinical skills (Cushing, 2015; Langendyk, Mason & Wang, 2016).

Practice implications

This study has significant implications for medical research and education. Having the possibility to assess quantitatively the patient-centeredness attitude may favour studies regarding the promotion of the patient-centered approach in the Italian medical professional and educational context. Also, having a validated Italian version of a questionnaire widely used internationally may enhance international cross-cultural efforts and foster discussion in the field.

Moreover, the 8-item version of the PPOS may have greater applicability than the original 18-item version in both clinical and research contexts as it is shorter and therefore it poses less burden on participants. The PPOS-8-IT might be used for assessing and monitoring the attitudes of Italian medical students towards the doctor-patient relationship for educational and evaluative purposes. This will facilitate the design, and the evaluation of training focused on patient-centered communication and bio-psycho-social care behaviors amongst medical students.

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Covid-19 outbreak: A challenge calling for early intervention on contamination obsessive fears?

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ABSTRACT. L'emergenza COVID-19 è una fase estremamente delicata per i sistemi sanitari pubblici, che ha imposto ai singoli l'adozione di rigide restrizioni sui loro spostamenti e attività, cambiamenti nelle abitudini igieniche e norme di distanziamento sociale, essenziali a limitare o ritardare la progressione del virus. L'intervento precoce sull'insorgere di paure ossessive di contaminazione clinicamente rilevanti, uno dei sintomi più caratteristici del disturbo ossessivo-compulsivo (DOC), in un periodo critico quale quello attuale, è un tema di prioritaria importanza nel dibattito sulle conseguenze psicologiche della pandemia nella popolazione mondiale. La diagnosi e la presa in carico dei pazienti con DOC da parte di specialisti della salute mentale avvengono generalmente con un ritardo di numerosi anni. Una prolungata latenza nel trattamento di questa condizione si associa a sua volta a una peggior prognosi, una maggiore resistenza terapeutica e un quadro clinico più grave, nonché più elevati costi socio-sanitari. La ricerca scientifica sui fattori di vulnerabilità e sui meccanismi protettivi coinvolti nello sviluppo del disturbo è ancora agli albori, l'inizio di un percorso essenziale a implementare strategie di intervento precoce *evidence-based*, soprattutto nell'attuale emergenza COVID-19.

SUMMARY. The present Covid-19 outbreak is an international public health emergency that has imposed to people strict mobility/activity restrictions and changes in the hygiene habits, essential to limit/delay virus diffusion. Early identification of and intervention on contamination obsessive fear, a core symptom of obsessive-compulsive disorder (OCD), are always of paramount importance, and in critical periods, such as the present one, should be imperative. OCD is generally associated with a delay in the correct diagnosis and first professional management of several years after symptom onset. A longer duration of untreated illness is in turn associated with a worst prognosis, higher treatment resistance and other clinical complications, as well as increased societal costs. It seems to be crucial to promote research efforts devoted to the early identification of subgroups at risk of developing clinically relevant contamination symptoms, to understand more deeply the vulnerability and protective mechanisms involved in this pathophysiological process in order to plan evidence-based early intervention strategies.

Keywords: *Covid-19, Pandemic, Obsessive-compulsive disorder, Contamination fear, Obsessive beliefs, Early intervention*

BACKGROUND

The World Health Organization (WHO) on March 11 2020 defined Covid-19 outbreak as a pandemic, a public health emergency of great international concern that all countries should soon strive to contain its rapid progression (WHO, 2020). As a result, several governments introduced a series of countermeasures to limit or at least to slow down the virus spread including more rigorous hygiene habits, more or less severe moving and activities restrictions, and quarantine.

With no doubt, this dramatic social change represented and still represents a highly stressful life event with a negative impact on daily habits and healthy behaviours: therefore, it potentially may favour the onset of symptoms in individuals with a pre-existing vulnerability for psychopathology, or sharpening distress in clinical groups who already suffer from a psychopathological disorder, but even in healthy subjects in peculiar periods of their life. This is particularly relevant for the onset of or exacerbation of clinically meaningful contamination fears and the related impairing safety behaviours (i.e., washing/checking, avoidance, reassurance seeking by doctors/Internet) in individuals with obsessive-compulsive (OC) tendencies, or with a full diagnosis of obsessive-compulsive disorder (OCD). All these negative effects may be also amplified by distorted, ambiguous or simply inaccurate information provided by the media on the risk of contamination (Brooks et al., 2020).

Contamination fear is considered one of the core symptoms of OCD (McKay & Carp, 2017). Its epidemiology is quite heterogeneous across the studies and some evidence, although controversial, would suggest that it represents the most frequent symptom subtype of OCD, affecting around 25-60% of patients (Karadağ, Oguzhanoglu, Özdel, Ateşci & Amuk, 2006; Li, Marques, Hinton, Wang & Xiao, 2009; Mahgoub & Abdel-Hafiez, 1991; Markarian et al., 2010; Ruscio, Stein, Chiu & Kessler, 2010). Such heterogeneity may be attributed to a number of methodological differences in the assessment instruments, samples' recruitment strategies, and cultural contexts (McKay & Carp, 2017). Cultural differences in the epidemiology of contamination fears are not still well-established due to the lack of evidence on non-Western cultures and ethnic minorities (Bloch, Landeros Weisenberger, Rosário, Pittenge & Leckman, 2008), despite the research effort on this topic is increasing during the last years (Williams, Chapman, Simms & Tellawi, 2017). Interestingly, African Americans with OCD have been found to report more contamination symptoms than European Americans with OCD (Williams, Elstein, Buckner, Abelson & Himle, 2012).

The early identification of contamination fears is always of paramount importance, but in critical periods, such as the present one, should be imperative. OCD is generally associated with a delay in the correct diagnosis and first professional management of around 9-10 years after symptom onset (Dell'Osso, Camuri, Benatti, Buoli & Altamura, 2013). A longer duration of untreated illness is in turn associated with a worst prognosis, higher treatment resistance and other clinical complications, as well as increased societal costs (Fineberg et al., 2019).

Recently, an umbrella review on risk and protective factors of OCD led to the conclusion that, despite the quite large amount of data including prospective designs, there is no solid evidence that certain factors can predispose to or protect from the development of OCD (Fullana et al., 2019)

In light of all these considerations, it seems to be crucial to promote research efforts devoted to the early identification of subgroups at risk of developing clinically relevant contamination symptoms, to understand more deeply the vulnerability and protective mechanisms involved in this etiopathogenetic process in order to plan evidence-based early interventions strategies.

SUBGROUPS AT RISK FOR CONTAMINATION OBSESSIVE FEARS AT COVID-19 TIME

Different subgroups may be considered at higher risk for contamination-based OC symptoms during the current Covid-19 emergency and should be carefully monitored on OCD-related outcomes.

The offspring of first-degree relatives with OCD diagnosis and contamination symptoms should be regarded as a vulnerable group due to the potential genetic vulnerability and the possible effects of vicarious exposure to probands' beliefs/behaviours, distress and emotional regulation difficulties (Chacon et al., 2018; Rector, Cassin, Richter & Burroughs, 2009).

During quarantine, a heightened use of social media can also increase the risk to be exposed to biased information about the Covid-19, therefore, to a more frequent trend to use these media to seek compulsively reassurance against fears.

Moreover, those OCD patients who are in remission/recovery after a successful treatment should be periodically monitored with respect to their risk of relapse, as several procedures due to quarantine and strict hygiene measures can increase their risk for relapse. Indeed, some reasoning errors specific to OCD vulnerability may develop during this period, such as the so-called *ex consequentia* reasoning ("I am washing my hands, therefore there must be dirt") (Dèttore & O'Connor, 2013). As previously reported (Tibi et al., 2017), depressive symptoms emerging during the quarantine due to the strong reduction of positive reinforces, can in turn represent vulnerability/maintenance factors or consequences of OC symptoms. The effects of quarantine on the recrudescence of OC symptoms may be also exerted through increased family accommodation, heightened parental control, more intense exposure to relatives' depression/anxiety or marital distress (Berman et al., 2018; Wu et al., 2016).

The exacerbation of OC symptoms in patients with a full OCD diagnosis should be carefully assessed during Covid-19 outbreak with respect to the risk of developing other psychopathological conditions. Indeed, it has been reported that in the long-term, young OCD patients may suffer from psychotic spectrum disorders (Meier et al., 2014).

Elderly people represent another subgroup that should be strictly assessed for late-onset contamination fears (Haines et al., 2020), as epidemiological and clinical data showed that elderly women and those individuals with lower cognitive functioning are at a higher risk for these symptoms (Dell'Osso et al., 2017; Prouvost, Calamari & Woodard, 2016). Even women during all pregnancy phases should be monitored for psychological wellbeing and distress regarding excessive contamination fears during Covid-19 time, since basically they are at greater risk for OCD, as compared with the general female population, with an aggregate risk ratio of 1.79 (Fawcett et al., 2013). Generally, during pregnancy, contamination fears and even intrusive thoughts and images of intentional harm to infants may be frequent (Collardeau et al., 2019; Lawrence, Craske, Kempton, Stewart & Stein, 2017), however they may become excessive, distressing and really "pathological" when elicited by a pandemic.

We consider healthcare professionals another high-risk subgroup for excessive contamination fears, because they are constantly exposed to contamination risk, frequent contacts with infected people, and they have to cope with the traumatic effects of the Covid-19 outbreak (i.e., loss of sick patients and colleagues, working in emergency situation with inappropriate safety equipment). This subgroup may also suffer from a high sense of responsibility regarding contaminating their relatives, a potential risk factor for OCD development.

For all the above-mentioned subgroups, early signs of OC symptoms should be early identified to implement timely and even early intervention strategies. Some authors (Fontenelle & Yücel, 2019) proposed a staging model of OCD where ultra-high risk is based upon sub-threshold symptoms (i.e., a total Yale-Brown Obsessive Compulsive Scale score, Y-BOCS; Goodman et al., 1989), the gold standard scale to assess symptom severity, in the 1-13 range, coupled with the presence of a positive family history of OCD or tics. In any case, a key ingredient to develop early approaches is the knowledge of early predictors of OC symptoms in community people (Brakoulias, Perkes & Tsalamanios, 2017).

According to cognitive models, meta-analytical evidence and prospective studies in adults, children/adolescents and pregnant women, obsessive beliefs including perfectionism/intolerance of uncertainty, inflated sense of responsibility, threat overestimation, importance/control of thoughts may act as specific risk and maintenance factors of OC symptoms (Abramowitz, Khandker, Nelson, Deacon & Rygwall, 2006; Mantz & Abbott, 2017; Pozza & Dèttore, 2014; Salkovskis, 1985). Research on the specificity of such beliefs for contamination symptoms has not produced consistent evidence, yet. It may be hypothesized that some of them, i.e. threat overestimation, intolerance of uncertainty and inflated sense of responsibility for causing/not preventing Covid-19 contagion, might even play a stronger role in the current dramatic emergency.

The assessment of the risk for pathological contamination symptoms should also take into account the distinction between harm avoidance processes and disgust avoidance (Melli, Chiorri, Carraresi, Stopani & Bulli, 2015). Two disgust-related psychological processes, i.e. disgust propensity and disgust sensitivity, have been found to be specific predictors of contamination-based symptom changes and they should be evaluated in early screening programs conducted on community individuals (Olatunji, 2010).

Other cognitive constructs (e.g., anxiety sensitivity, not just-right experience, inferential confusion and propensity to deontological guilt) (Coles & Ravid, 2016; Ottaviani, Collazzoni, D'Olimpio, Moretta & Mancini, 2019; Wheaton, Mahaffey, Timpano, Berman & Abramowitz, 2012), or some

family processes, such as the tendency to rely on proxy to access internal states or expressed emotion (Zhang et al., 2017), already related to increased risk for OCD, should also be considered.

Finally, the potential change in the sleep cycle pattern and the consequent sleep disturbances represent another mechanism that might increase the risk for the emergence or exacerbation of OC symptomatology is. Some studies showed that eveningness and sleep disturbances might mediate and even prospectively predict the worsening of symptoms in patients with OCD independently from the presence or absence of depressive symptoms (Cox, Tuck & Olatunji, 2018; Paterson, Reynolds, Ferguson & Dawson, 2013).

All these vulnerability/maintenance factors involved in the pathway towards the onset of contamination fears should be comprehensively assessed through longitudinal designs in large community samples with the aim of early identifying at-risk subgroups.

BEYOND SYMPTOMS: LOOKING FOR PROTECTIVE FACTORS

While the above-mentioned vulnerability/maintenance factors may be assessed and monitored through screening programs in vulnerable groups, protective factors should also be taken into account. Some factors may be expected to reduce the progression of contamination symptoms, such as a strong awareness of OCD-related vicious cycles and its early warning signs in vulnerable individuals, patients and their relatives.

As shown by some meta-analyses, social support and marital adjustment seem to represent a sort of protective factors against the onset/exacerbation of OC symptoms during quarantine (Palardy, El-Baalbaki, Fredette, Rizkallah & Guay, 2018). Other evidence showed that personality factors including emotional stability, resilience and coping strategies act as protective dimensions, particularly among adolescents (Hjemdal, Vogel, Solem, Hagen & Stiles, 2011; Moritz et al., 2018; Stavropoulos, Moore, Lazaratou, Dikeos & Gomez, 2017). Other individual characteristics may be considered as resources such as mindfulness skills, self-compassion and personal values (e.g., Leeuwerik, Cavanagh & Strauss, 2020). Similarly, other health-related variables may show a positive impact on dysfunctional contamination fears, such as healthy behaviours including daily walking and exercise (although currently limited by several governments), correct eating habits, lack or reduction of cigarette smoking or substance abuse (Abramovitch, Pizzagalli, Geller, Reuman & Wilhelm, 2015). All these healthy habits may produce a beneficial effect also on demoralization or depressive symptoms closely dependent on OC symptoms (Buchholz et al., 2019). For ethnic minorities some social positive factors may be important during this period such as positive ethnic identity and being part of a religious community (Williams & Jahn, 2017).

Finally, for all vulnerable subgroups and patients with OCD, the use of digital technologies and social media should also be considered as a way to maintain or strengthen social networks and the possibility to do one's job by flexible forms of work organization such as smart working, may have beneficial effects on self-esteem and mood.

EARLY INTERVENTION OPTIONS

Some early intervention strategies may be helpful during the Covid-19 outbreak when contacts with clinicians are expected to be less frequent or even impossible. During this time window where mental health services and clinicians are less available, untreated symptoms might get worse. Several well-conducted meta-analyses demonstrated that cognitive behavioural therapy (CBT) delivered through health technologies, i.e. telephone, web-cameras and smartphone apps, may produce great benefits on a variety of OCD-related outcomes including intrusive thoughts, compulsive behaviours, symptom awareness, obsessive beliefs, quality of life and depressive features (Dèttore, Pozza & Andersson, 2015; Wootton, 2016). This modality of delivering CBT is cost-effective and has the advantage of reaching a large number of people; it may be particularly helpful as early intervention strategy for individuals with sub-threshold symptoms and those vulnerable to OCD onset. Health technology-based CBT may promote psychoeducation that can increase the awareness of the individual on the cognitive-behavioural vicious cycles of OCD in order to prevent catastrophic meta-worry capable to worsen symptoms (Besharat, Atari & Mirjalili, 2019).

Internet-based therapies for OCD should include information on how to perform evidence-based exposure and response prevention and cognitive interventions. The importance of exposure and response prevention during the

quarantine may be related also to its antidepressant effects, since it can function as a behavioural activating process (Blakey, Abramowitz, Leonard & Riemann, 2019).

Additional approaches have been proven to be effective and are particularly suitable for e-learning modalities such as mindfulness-based interventions or acceptance and commitment therapies (Jalal et al., 2018; Kulz et al., 2019). Such third-generation approaches might produce positive changes on some mechanisms involved in the maintenance of symptoms in clinical and subclinical groups, such as attentional biases and experiential avoidance (Haberkamp, Schmidt, Hansmeier & Glombiewski, 2019).

Other pure self-help resources including self-help books, Internet websites and other online reading materials may be helpful for some patients or other individuals reporting clinically relevant contamination fears (Pearcy, Anderson, Egan & Rees, 2016). Self-help chats guided by expert patients might be another future direction for therapy, particularly due to the reduction in the economic resources of the patients.

Novel therapeutic scenarios can include a greater involvement of family members in the therapeutic pathway of patients, since the quarantine imposes to people a more frequent and closer contact with their relatives. Therefore, a reflection is necessary on the involvement family members living with the patient in the therapeutic process, for both young and adult patients (Baruah et al., 2018; Belus, Baucom & Abramowitz, 2014; Rosa-Alcázar et al., 2019), as it should be evaluated in individual cases.

However, while all these approaches may have the strength of being a good option for those individuals suffering from social stigma, they can have the disadvantage of selecting the patients since those who have a weaker motivation to change may be reluctant to initiate such programs or may be more likely to drop out (Monaghan et al., 2015).

The ERP is a time-consuming technique demanding a high effort from the patient. Therapeutic alliance and some techniques, such as motivational interview conducted by a therapist, might be key ingredients in the motivational process that precedes engagement in exposure (Simpson & Zuckoff, 2011; Vogel, Hansen, Stiles & Götestam, 2006). Evidence about the role of therapists' variables on dropout risk is, however, inconclusive (Ong, Clyde, Bluett, Levin & Twohig, 2016). In addition, since quarantine does not permit exposure practice outside home, therapists should consider the use of imaginal exposure to a greater extent than before when in-office or real-life exposures were possible (Maloney, Koh, Roberts & Pittenger, 2019). The use of interoceptive exposure might add some therapeutic benefits in terms of helping the patients to manage more effectively arousal-related signs and catastrophic beliefs (Blakey & Abramowitz, 2018).

Early intervention at the coronavirus time should also consider the risk that individuals experience traumatic feelings due to loss of loved ones, hospitalization, Covid-19 symptoms or terrific social media representations of the illness (Depoux et al., 2020). Therefore, trauma-focused interventions including Eyes Movement Desensitization Reprocessing may provide a positive contribution to the management of post-traumatic symptoms (Marsden, Lovell, Blore, Ali & Delgadillo, 2018).

PARADOXICAL EFFECTS OF COVID-19 OUTBREAK ON CONTAMINATION FEARS IN PATIENTS WITH OCD

While Covid-19 outbreak can be expected to represent a triggering factor towards developing OCD in some subgroups, this dramatic emergency could elicit some relatively useful effects amongst other subgroups. It is well established that perceived social stigma, shame and fear of negative evaluation might contribute to worsen OC symptomatology in chronic patients (Durna et al., 2019). Paradoxically, Covid-19 pandemic and the related avoidance and strict hygiene habits might hypothetically normalize the subjective experience of patients with chronic OCD and might be even useful to reduce social stigma among patients with a diagnosis of chronic OCD. This appears to be a quite likely epiphenomenon of the emergency, since almost everybody now adopts frequent and almost ritualistic hand washing, social distancing or other hygiene measures.

It may be expected that the restrictive measures imposed by the pandemic to patients' daily life might shift their attention from rituals to new values, such as awareness of the present moment or the importance of freedom. Several studies suggest that some individuals may experience positive psychological changes following exposure to trauma (Sherr et al., 2011). Therefore, the highly challenging life circumstances produced by Covid-19 outbreak might paradoxically be associated with positive psychological changes, and promote

a kind of post-traumatic growth, including perceptions of personal strength, intimate relationships, appreciation of life, new possibilities, and spirituality (Tedeschi & Calhoun, 2004). In addition, the drastic changes in people's lives might reduce the expectations of family members towards symptom changes in their relatives with OCD, thereby reducing unrelenting standards//excessive criticism which often maintain the disorder in these patients (Kim, Lee & Lee, 2014).

The Covid-19 outbreak should, thus, be regarded as a challenge to understand the onset and the progression of contamination fears. Longitudinal research should ascertain psychological factors potentially involved in the development of such fears in community people without OCD, in those with a latent vulnerability towards its development and in clinical populations.

CONCLUDING REMARKS

Covid-19 outbreak represents a severely stressful life event with a potential impact on people with vulnerability to OCD, in those patients with sub-threshold OC symptoms, or in those who achieved recovery after a successful treatment. Severe mobility and activity restrictions, and changes in the hygiene habits are essential to limit Covid-19 diffusion and delay its progression. However, the occurrence of dysfunctional, clinically relevant contamination fears may be the downside highlighting the importance of a more comprehensive knowledge on the vulnerability pathways towards the onset of pathological contamination fears in order to inform policy making and risk communication on one hand, early identification, intervention and possibly prevention on the other one.

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