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Barriers and facilitators to conducting research by early career psychiatrists: a literature review

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Abstract

Objectives: To understand and identify factors that promote and prevent research participation among early career psychiatrists (ECPs), in order to understand what would encourage more ECPs to pursue a research career.

Methods: We conducted an electronic search of databases (PubMed and the Cochrane library) using the keywords 'doctors', 'trainees', 'residents', 'physicians' and 'psychiatric trainees' as well as 'research' (MeSH) and 'publishing' (MeSH). This search was complemented by a secondary hand search.

Results: We identified 524 articles, of which 16 fulfilled inclusion criteria for this review. The main barriers included lack of dedicated time for research, lack of mentoring and lack of funding. The main facilitators were opportunities to receive mentorship and access to research funding.

Conclusions: Action is needed to counteract the lack of ECPs interested in a career in research. Specific programs encouraging ECPs to pursue research careers and having access to mentors could help increase the current numbers of researching clinicians in the field.

Keywords

Barriers, facilitators, research training, psychiatric training, early career psychiatrists, psychiatric trainees, residency training

BACKGROUND

Research is a fundamental part of every medical discipline as it enables progress in the understanding of underlying factors for disease development, diagnostic tests and treatments of disorders (Bhugra et al., 2015, Dellis, Skolarikos & Papatsoris, 2014). Importantly, psychiatry is a discipline with unparalleled

unmet clinical needs (Abrams, Patchan & Boat, 2003). Previous studies, however, highlight how psychiatric trainees engage in research activities less often when compared to those of other medical disciplines (Gorwood, 2010, Burke, Pincus & Pardes, 1986, Goldstein, Guerra & Regier, 2014), although there are differences across countries. In an American study with 622 child and adolescent psychiatrists, only 10% met an empirical

definition of a researcher (Mrazek, Shapiro & Pincus, 1991). This definition describes a researcher as a person who: i) spends at least 20% of their time in research, ii) has had at least one original paper published in the two preceding years and iii) has external funding or assigned time for research activities (Beatty et al., 1986). Moreover, only 20% of the psychiatric departments of American medical schools were found to be research-intensive (Reynolds et al., 2009). Furthermore, the number of early career psychiatrists (ECPs) engaging in research appears to be reducing (Silberman et al., 2012), although there are no precise data to explain this.

One of the main goals of (academic and clinical) education in psychiatry should be to encourage individuals in the early stages of their careers to conduct research (Dellis et al., 2014). The lack of motivation to pursue a career in psychiatry research could be addressed as early as in medical school. A study in the USA (Curran et al., 2015) had interviewed first-year medical students from six American medical schools who participated in a mentored summer program in geriatric psychiatry. Students were asked about their research interests and whether they would like to pursue an academic career. Results indicated that 66% of students were interested in an academic career, 44% in a career in geriatric psychiatry/medicine and 36% in academic geriatrics. These figures indicate that students could be motivated into academic spheres if their interest is sparked. Other research indicates that only 10–20% of trainees lack interest in taking up an academic career (Kuzman et al., 2009, Williams, Curran, 1998). Getting experience in research early in training enables ECPs to balance research time as well as clinical work, and might have an impact on their professional choices (Torous, Padmanabhan, 2014). However, in child and adolescent psychiatry (CAP), only one third of all curricula across Europe offer mandatory research training (Simmons et al., 2012). Psychiatric trainees are also confronted with a number of factors impacting their interest and engagement in scientific work. Although previous studies have identified heterogeneous factors that facilitate and prevent trainees of any medical discipline (e.g., surgery or other clinical disciplines [Canadian Plastic Surgery Research Collaborative (CPSRC), 2017, Kwan et al., 2017]) establishing and/or continuing research activities, there is a lack of understanding of what facilitates/prevents people at the beginning of their careers in psychiatry from engaging in research. The purpose of this review was to identify research studies conducted on ECPs, and to synthesize information about facilitators and barriers to them engaging in research.

METHODS

Search strategy

The electronic search of the literature was performed in the databases PubMed and the Cochrane library. The following search terms were used: doctor descriptors ('doctors', 'trainees', 'residents', 'physicians'), ECP descriptors ('psychiatric trainees', 'early career psychiatrists'), and research descriptors ('research' [MeSH] and 'publishing' [MeSH]). A secondary hand search was performed in the relevant psychiatric journals and grey literature. Moreover, experts were contacted to identify other relevant articles in the field. Additional web-based and manual searches for abstracts published from the conferences of the World Psychiatric Association (WPA), the American Psychiatric Association (APA) and the European Psychiatric Association (EPA) were carried out. The literature research was performed until August 2018.

Eligibility criteria

The review included primary studies reporting data on: i) psychiatric trainees or ECPs and ii) factors that represent barriers or facilitators towards research in psychiatry. We have included articles published in English, French and German.

Data extraction and analysis

Following the search, all potential studies were exported and duplicates removed. Titles and abstracts were screened for inclusion (MP). In cases where there was ambiguity about the relevance of the study, the full paper was obtained and reviewed. Twenty percent of abstracts were screened by a second reviewer (KK). Please see Figure 1 for a flow-chart of the papers included in this review. The content of the papers were analysed according to the main themes, which were grouped and categorised as either barriers or facilitators of ECPs conducting research.

RESULTS

The searches yielded a total of 524 articles, which were consecutively screened. Of these, 16 articles met the inclusion criteria, 12 corresponding to original research papers, one review paper, one essay, one report and one opinion paper (see Table 1). The studies finally included were published between 1998 and 2018, reporting results of a total of 1.606 participants. Factors that both facilitated and prevented ECPs from conducting research were identified.

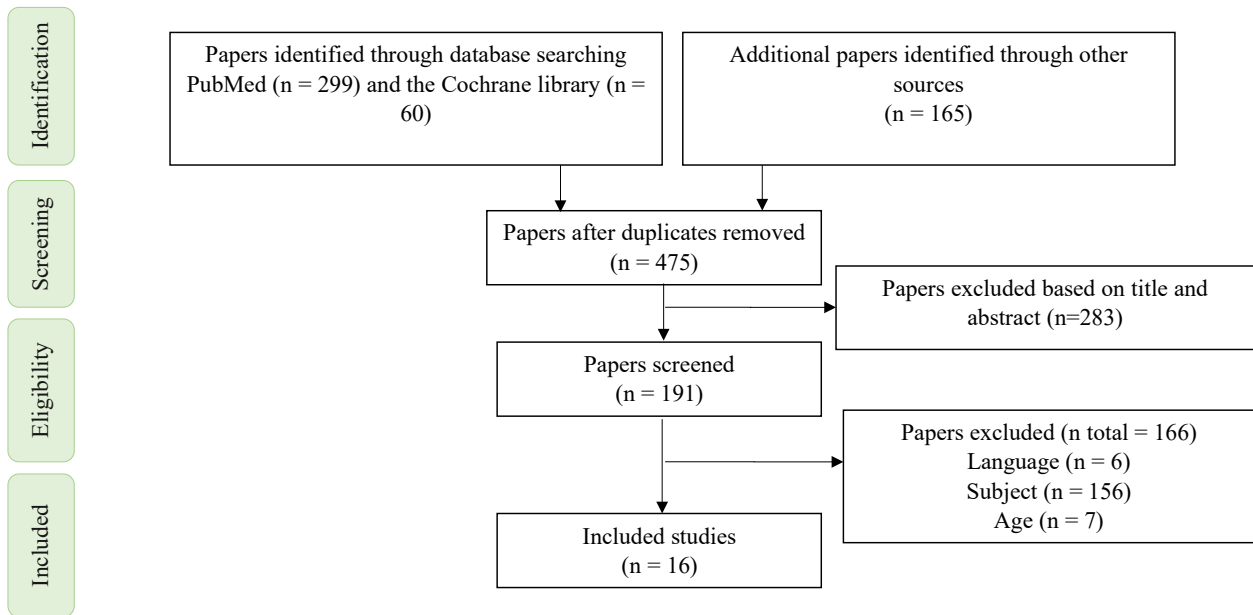


Figure 1. The number of studies identified, screened, included and excluded at each stage.

Barriers to conducting research

Lack of protected time and work-related stress

Seven studies identified a lack of uninterrupted time as a factor impacting research activity (Mitwalli, Al Ghamdi & Moussa, 2014, Williams, Curran, 1998, Torous, Padmanabhan, 2014, Laliberte et al., 2016). In a national study of psychiatric trainees in Portugal (n = 80), only 32% were involved in any type of research project and lack of time (15.4%) was among the top three reasons for non-involvement in research (Pinto da Costa et al., 2013). In a cross-sectional study in Serbia (n = 51 trainees), 29.2% of ECPs stopped research before finishing specialisation; they indicated having little research-dedicated time (Pantovic et al., 2012). Moreover, work-related stress has been identified as a major obstacle in performing research (Mitwalli et al., 2014). A survey of research opportunities and training strategies in 70 departments of psychiatry in the USA and Canada revealed a fairly low number of research training opportunities, with only approximately one-third of the programs offering a research track, and 52% of these programs reported that fewer than 10% of their trainees had joined a research track in the last five years (Balon, Singh, 2001).

Lack of funding

Two studies identified lack of funding as a prominent factor preventing ECPs from performing and continuing research.

Debt load has been found to correlate with decreased interest in research activities (Silberman et al., 2012) and represents a serious concern. On average, psychiatrists earn less money than colleagues from other specialties, and this is specifically true for child and adolescent psychiatrists (Remschmidt, van Engeland, 2012, Volpe, Boydell & Pignatiello, 2013). Researchers tend to earn even less than clinical practitioners, as they might not be able to join on-call duties (Abrams et al., 2003). In a cross-sectional study in Serbia on the research activities of ECPs (n = 51 trainees), lack of funding was identified as a major barrier (Pantovic et al., 2012). Similarly, in a survey in France (n = 603), half of the psychiatric trainees were motivated to go on to a Master's course (van Effenterre, 2011). However, one quarter of them had to choose their topic to correspond with funding resources and 40% needed to fund themselves with locum and on-call work.

Five studies report lack of funding for research projects (Bartels et al., 2010, Kuzman et al., 2009, Myint, MacLulich & Witham, 2006, Williams, Curran, 1998) or competition between researchers (Laliberte et al., 2016) for funds as a matter of concern. It was suggested that more research projects in psychiatry were focused on clinical topics than in other disciplines (Burke et al., 1986). Fewer studies investigated biological mechanisms in patients and, in general, research seemed to be neglected. In comparison to the current costs of treating patients with mental disorders (Whiteford et al., 2013), budgets for psychiatric research have been reported to be low

to non-existent when compared with large medication trials sponsored by pharmaceutical companies in somatic disorders, with the exception of larger trials of newer antidepressants or anti-psychotics (Sedvall, 2002). Moreover, the funds allocated to research are most frequently directed to researchers who have already achieved preliminary results and have more experience in the scientific field (Williams, Curran, 1998). In fact, only a small number of funding agencies are willing to support the research of ECPs in very early stages, which is an additional barrier to academic progress (Strauss, Yager & Offer, 1980). Thus, while little money is available in mental health and funding is already rare, larger grants are likely to be allocated to researchers in biological based research with more experience than ECPs (Reardon, 2017). This may explain the trend where promising researchers quit their academic career during their transition from research training to becoming independent researchers (Bartels et al., 2010).

Lack of support and mentorship

Eight studies investigated the issues of lack of support and mentorship. Many trainees are intimidated by research and feel they do not know enough to contribute. Trainees can feel uncertain about their choice of projects and of finding a suitable research question (Torous, Padmanabhan, 2014, Balon, Singh, 2001, Myint et al., 2006, Williams, Curran, 1998). Having a competent and dedicated mentor has been identified as a significant moderator of research participation (Iversen, Eady & Wessely, 2014, Kuzman et al., 2009, Laliberte et al., 2016, Mitwalli et al., 2014, Williams, Curran, 1998, Pinto da Costa et al., 2013). A dedicated mentor facilitates education (Stein et al., 2013) and opens access to a broad range of research and skills (Pinto da Costa, Oliveira & Abdulmalik, 2018).

Lack of training in research

Four studies used lack of training in research as a central topic. Research indicates that an important factor of trainees not taking up or continuing a research career is the lack of training in research methods in psychiatric curricula (Bartels et al., 2010, Mitwalli et al., 2014). A survey in committees dealing with educational issues in psychiatrists has shown that limited representation of researchers on boards that review residency curricula is an important factor in the USA, where little attention seems to be paid to research activities in psychiatric residency (Fitz-Gerald et al., 2001). While some clinical educators might argue that the goal of psychiatric training is only clinical, the view that clinicians need to have a basic knowledge in research to perform evidence-based medicine, has been the basis for recent approaches to medical training. This is demonstrated

by the development of the CanMEDS roles that describe the abilities physicians require and underscore that an important role of a medical doctor is that of the scholar, where life-long learning is expected (The Royal College of Physicians and Surgeons of Canada, 2019).

Although psychiatric training is considered to entail some exposure to research training, several barriers to research training during residency seem to exist, which range from regulatory (e.g., support for research experiences), institutional (e.g., grants, exposure to leading researchers) and personal factors (e.g., loan debts, perception of academic careers) (Abrams et al., 2003).

Even if a vast majority (98%) of trainees wanted (non-compulsory) research training to be a part of the curriculum, it is only an integral part of the curriculum in less than half of the training programs, according to an American study (Balon, Singh, 2001). In fact, respondents that were required to conduct research during residency were more likely to state that research helped them in their clinical practice and that it positively influenced their future career plans. Fifty-two percent of US-American programs stated that fewer than 10% of their trainees had started any research project of their own during the past five years.

Facilitators to conducting research

Access to mentors

Positive impressions and experiences with research were identified as facilitators by ten studies (Fogel, 2009, Iversen et al., 2014, Schnitzlein et al., 2015), which is why mentors could have a valuable role creating such impressions (van Effenterre, 2011, Pinto da Costa et al., 2018). According to Iversen and colleagues (Iversen et al., 2014), mentoring success depends on various factors. Strong predictors of successful mentoring include the selection of a mentor (e.g., through personal recommendation), a careful outline of the work with long-term mentoring, a positive relationship, the experience and skills of the mentor, as well as mentee characteristics (e.g., inexperienced researchers). A successful mentor should, according to their findings, help the trainee find solutions and discuss expectations from both sides. Moreover, it has been proposed that trainees should be made aware of opportunities for research at the facility in a structured way (Myint et al., 2006) and that fears and apprehensions should be discussed (Balon, Singh, 2001). Career-planning might help trainees to create more openness towards research (Schnitzlein et al., 2015). It is also important to engage trainees in research as early as possible

Table 1. Included studies.

| Authors | Country | Study design | N participants (response rate) | Facilitators for research | Barriers for research | Type of bias / limitation |
|--------------------------|-------------|---|---|---|--|--|
| Balon & Singh, 2001 | USA, Canada | Cross-sectional survey | 70/126 (58.7%) chairs of departments of psychiatry | <p>Trainees should be:</p> <ul style="list-style-type: none"> - made aware of opportunities to join research tracks during their orientation to the program - introduced to researchers in their department and made familiar with their work - assigned to spend time in research labs to familiarise themselves with the 'working conditions' of research - receive teaching about the clinical implications of research - fears and apprehension about joining research tracks should be addressed - research career opportunities should be discussed | | <ul style="list-style-type: none"> - only 60% of chairs returned the questionnaire - questionnaire did not ask for the absolute number of residents, only for percentages (e.g., 'How many % of residents joined a research track?') - only those curriculums with a reasonable training program in psychiatric research could have responded - anonymous responses might include academic or non-academic institutions - the university vs. non-university research training issue was not addressed |
| Bartels et al., 2010 | USA | Findings and recommendations of an expert consensus workgroup | | <ul style="list-style-type: none"> - establishing formal research methods teaching - more funding for structured research tracks for medical trainees - fostering of acceptance for clinical pathways by explicit inclusion of research tracks | The loss of promising researchers during the period of transition from research training to independent research funding | - |
| Fitz-Gerald et al., 2001 | USA | Cross-sectional survey | 399/815 (49.0%) trainees and faculty members | | - lack of appreciation of research in psychiatric curricula | - the survey was sent to Training Directors, who might have chosen to not hand over questionnaires to the residents |
| Fogel, 2009 | Worldwide | Literature review | Medical students, psychiatry trainees, psychiatry fellows/ postdoctoral, psychiatry faculty/ attending/consultant | <ul style="list-style-type: none"> - participating in research when a medical student or psychiatry trainee - mentoring | | - focused on adult psychiatry, search terms 'psychiatry' AND 'research' were not followed-up due to the high number of hits |
| Iversen et al., 2014 | UK | Cross-sectional survey, interviews | 157/227 (69.2%) mentees (clinician scientist fellows and clinical lecturers) and mentors (professors) | <p>Impact of mentoring:</p> <ul style="list-style-type: none"> - mentee's age - the frequency and duration of meetings - mentee's expectations - the quality of the mentee - mentor interaction - the perceived role of the mentor | | <ul style="list-style-type: none"> - as the survey was anonymous, pairing of mentor and mentee data was not possible - investigation took place early in the mentoring process, better peer-mentor relationships might have been established later on - data collected only cross-sectionally |

Continued Table 1. Included studies.

| Authors | Country | Study design | N participants (response rate) | Facilitators for research | Barriers for research | Type of bias / limitation |
|------------------------|--------------|------------------------|--|--|---|--|
| Kuzman et al., 2009 | Croatia | Cross-sectional survey | 66 trainees from 15 psychiatric hospitals, clinics and wards in general hospitals | | lack of practical psychotherapy inadequate functioning of the mentorship system lack of funding resources | - variables other than the residency training were not assessed (e.g., socioeconomic, marital status, etc.) and may have influenced results |
| Laliberte et al., 2016 | Canada | Cross-sectional survey | 207/853 (23.4%) psychiatry trainees | Exposing and engaging psychiatry trainees in research as early as possible appears key to promoting future research interest Psychiatry residency programs and research tracks could consider: - emphasising research training initiatives - protected research time early in residency | Putatively: - lack of continuity in research time during potentially productive years - competing for grants with graduating PhD students from other disciplines - relative lack of research mentoring | - study was primarily aimed at residents with an interest in geriatrics - some potential predictor variables (e.g., level of trainees' debts, academic productivity) have not been collected in the study - causality is difficult to infer from a cross-sectional study - multiple comparisons may have contributed to alpha inflation - response rate of 24.3% |
| Mitwalli et al., 2014 | Saudi Arabia | Cross-sectional survey | 191/207 (92.3%) trainees registered with the Saudi Council of Health Specialty Programs | | Lack of : - research training (93.2%) - time (89.5%) - supervisors (73.3%) - work-related stress (83.2%) | - high rate of male participants (M: 128, F: 63) might inhibit the generalisability of data |
| Myint et al., 2006 | UK | Cross-sectional survey | 122/400 (30%) trainee members of the British Geriatrics Society (BGS), 30% response rate | Systematically provide basic information on how to enter into the early stages of research | no clear idea of a topic to research (70%) did not know how to develop an idea (64%) did not know how to get funding (62%) Difficulties during research: - funding - selection of project topic | response rate of 30% |
| Pantovic et al., 2012 | Serbia | Cross-sectional study | 51 ECPs | government support less overall challenges | - opinion that psychiatry is 'second best' career - no education on research | - small number of residents (51) participated - residents of only one hospital |

Continued Table 1. Included studies.

| Authors | Country | Study design | N participants (response rate) | Facilitators for research | Barriers for research | Type of bias / limitation |
|-----------------------------|----------|------------------------|--|--|---|---|
| Pinto da Costa et al., 2013 | Portugal | Cross-sectional survey | 80/193 (41.5%) psychiatric trainees | | - lack of access or support from supervisors, other consultants or professionals (75.0%) - lack of time (15.4%) - lack of interest (9.6%) | - most respondents from 1 st or 2 nd year of education |
| Schnitzlein et al., 2014 | USA | Opinion paper | | - mentorship - scholarship - research - career planning and development - openness to experience - networking - responsibility seeking | | - |
| Silberman, 2012 | USA | Cross-sectional survey | 127/189 (67%) senior trainees | Allocating funding to ensure sustained and secure careers | Debt load | - respondents were not explicitly asked about their research interest at the beginning of residency, but only toward the end - bias: participants were researchers in a higher number of cases - gender imbalance (F: 67.9%) - only residents have been investigated - not all programs have been investigated - data not corrected for multiple comparisons |
| Torous & Padmanabhan, 2014 | USA | Essay | | Getting experience in research early in training to balance research time as well as clinical work | - lack of (uninterrupted) time - problems in finding a suitable research question | - |
| van Effenterre et al., 2014 | France | Cross-sectional survey | 79/125 (63.2%) teachers, professors, hospital practitioners | | Insufficient number of academic practitioners | - bias: overrepresentation of residents with interest in research - satisfaction with education reflects an individual perception and is therefore less objective |

Continued Table 1. Included studies.

| Authors | Country | Study design | N participants (response rate) | Facilitators for research | Barriers for research | Type of bias / limitation |
|-------------------------|---------|------------------------|---|---------------------------|--|---|
| Williams & Curran, 1998 | UK | Cross-sectional survey | 57/99 (57.6%) senior registrars working in psychiatry | | <ul style="list-style-type: none"> - clinical work intrudes (54%) - lack of time (53%) - uncertainty on how to proceed (30%) - lack of support from senior staff (30%) - lack of resources (30%) - own lack of interest (21%) - put off by the idea of writing a protocol (12%) | <ul style="list-style-type: none"> - bias: respondents may over-represent those actively taking part in research |

to promote future interest in academic careers (Laliberte et al., 2016). This might help to balance research time and clinical work due to the experience of the trainee researchers (Torous, Padmanabhan, 2014). Compulsory research activities that are well-supported and organized might help involve trainees in a more structured way (Rosenkranz, Wang & Hu, 2015).

Opportunities for funding and integration in to clinical practice

Funding and dedicated research time is a major issue for trainees in psychiatry, as stated by five studies in the field (Bartels et al., 2010, Laliberte et al., 2016, Silberman et al., 2012, Schnitzlein et al., 2015, Torous, Padmanabhan, 2014). It has to be stressed that the availability of funding for independent research together with the option to publish one’s own research results are the strongest predictors of the future engagement in research activities (Ross et al., 2009). High quality education programs and integrative clinical and research placements, together with the strategic development of the workforce, have been found to reduce staff turnover and to create a culture where learning and supervision are highly valued and contribute to the personal development of students (Cohen et al., 2011, Martimianakis et al., 2009). Such programs not only provide technical details for research but also encourage mentoring and create networks of social support (Yager et al., 2007).

Encouraging research from as early as medical school

One way to foster early research involvement is to gain the interest of medical students prior to them graduating from

medical school, which was underlined by one study (Fogel, 2009). Recruiting medical and postgraduate students into research schools seems beneficial, enabling them to meet with experts that might become mentors in their first research projects, as shown in American (Balon, Heninger & Belitsky, 2006), European (Mihai et al., 2006) and Asian (Naqvi, Khan, 2007) settings. This is specifically important, as the career choice of psychiatry does appear to be quite modifiable in medical students (Goldenberg, Williams & Spollen, 2017). It seems that at the beginning of their career, students are less interested in prestige and monetary compensation and more in patient interactions as well as working conditions (Feifel, Moutier & Swerdlow, 1999). This is why this period represents an ideal time to recruit students into psychiatry as a career choice, and specifically, the academic pathway.

DISCUSSION

Key findings

The majority of studies on ECPs outlined a positive attitude towards research, with most ECPs believing that research is useful for their personal development, professional careers and for the advancement of psychiatry (Fitz-Gerald et al., 2001). However, only a restricted number of trainees have had the opportunity to access structured research education in their curriculum or have been offered protected time for research (Mitwalli et al., 2014). Only a minority of programs offer research-related topics as a fixed component of their curricula. Generally, lack of time for research was the obstacle most frequently indicated, as trainees are occupied with studying and clinical rotations (Williams,

Curran, 1998, van Effenterre, 2011). In a survey conducted in Germany (n = 108 trainees), it was reported that 50% of the research was carried out during the trainees' and researchers' personal free time (Bitzinger, Heberlein & Theilmeyer, 2014). The amount of funding among researchers was also found to correlate with the time spent in research (Lee, Ognibene & Schwartz, 1991). Moreover, insufficient mentorship was frequently identified as a common reason to not pursue research during or after residency (Lehmann et al., 1992). Two further obstacles that prevent specifically ECPs from performing research included lack of appreciation of research in psychiatric curricula (Kupfer et al., 2002, Balon, Singh, 2001, Fitz-Gerald et al., 2001) and low funding options for psychiatric research (Williams, Curran, 1998, Sedvall, 2002, Emsley, 2001, Patel, Sumathipala, 2001). In the early stages of their careers, ECPs are discouraged by insufficient funding (Strauss et al., 1980), as money is usually awarded to those researchers that have already accomplished research results and engage in specific fields. Insufficient funding might lead to a restricted choice of topics, lower quality of research papers and fewer publications (Patel, Sumathipala, 2001).

Strengths and limitations

Our review provides an extensive literature overview, providing a summary of the different obstacles and motivators that play a role in whether ECPs conduct research in psychiatry. It covers a significant number of articles, from a range of countries and languages. The study however has several limitations. Firstly, the study results extracted for this review were not consistently reported, which makes it difficult to synthesize the data and compare studies. Secondly, although it was possible to extract some qualitative data about the barriers and facilitators, the available data was limited to conduct a narrative synthesis. Thirdly, the papers included are from a limited number and mainly from high-income countries, and there is a knowledge gap about the reality in low-income countries. Fourthly, although we focussed on ECPs, perhaps different or similar facilitators may arise for clinicians at other career stages which we did not focus on in this study (e.g., medical students or later on in a psychiatrist's career). Lastly, data was extracted from only two major databases.

Comparison with the literature

A series of additional approaches have been earlier identified as helpful to engage trainees into research, and to support them during their research careers. This includes ECPs networks, training programs, utilising medical students as a resource and pursuing independent research.

In Europe, trainee-led organisations, such as the European Federation of Psychiatric Trainees (EFPT) (Schulze, Treichel, 2002) and the European Psychiatric Association – Early Career Psychiatrists Committee (EPA – ECPC) (Hanon et al., 2015), have been successful in promoting research among junior psychiatrists in recent years, and formed dedicated task forces (Kuzman et al., 2009). Several European-wide early-career psychiatrist-driven studies have been carried out completely independently leading to high-quality publications, where all the co-authors were junior researchers (Koelkebeck et al., 2015, Kuzman et al., 2017, Jovanovic et al., 2016, Pinto da Costa et al., 2017, Pinto da Costa et al., 2019).

Mentoring is a way for trainees to gain knowledge about research skills and to learn ways to manage a work-life balance through the advice of senior colleagues who may have established a balanced research-clinician life (Ng et al., 2017). Research mentoring can be improved by structured guidance on how to act and what to expect as a mentor and a mentee (van Schalkwyk et al., 2016), which could be provided by professional organisations. In addition, mentors can stress the benefits of research, such as the excitement of discovery, variety, flexibility in work schedules and a broad network of colleagues (Abrams et al., 2003). The quality of mentoring can also be heightened by educational courses for mentors and also peer-mentors (Cheung et al., 2017). In fact, it has been shown that peer-mentoring might be helpful in establishing a research career, improving communication, mutual support and collaboration more effectively than a faculty-trainee mentoring relationship. This innovative approach requires minimal funding and has been shown to successfully engage trainees involved in psychiatric care and research (Posporelis et al., 2014). Mentoring schemes, either by peers or by senior psychiatrists, are offered to help ECPs maintain continuous mentoring and motivation, independent of the structures in their own departments, as demonstrated in the EPA Mentorship Programme or the European College of Neuropsychopharmacology (ECNP) Certificate Programme (Riese et al., 2016).

Another promising trainee initiative is the short-term research internship program that is offered by the ECNP Junior Members Advisory Panel, the EFPT Exchange or the EPA-ECPC Gaining Experience Program (GEP). Funded by several psychiatric professional organisations, junior researchers are offered the chance to participate in conferences to strengthen their networks. Summer schools for developing practical skills, such as ECNP Schools and workshops for junior scientists, provide ECPs with opportunities to develop research skills. Intensive training courses in psychiatric research methods and skills are offered at the Berlin Summer School in a one-week

course and participants report feeling satisfied with this and that the course had a positive impact on their careers (Mihai et al., 2006). To disseminate this information, the aforementioned organisations offer networks of mailing lists, internet pages and annual events, where ECPs are informed about opportunities available.

As shown earlier, it is hard in the beginning to start one's own research and the lack of funding and mentoring might lead to frustration among psychiatric trainees. Piggy-back studies or secondary analyses of data might be helpful to get started, specifically if publications are needed to attain funding (Blazer, 2014), but might not be enough to foster independent research (Andlauer, Feffer & Riese, 2014). Other non-research publications (e.g., letter to the editor or reviews) might also help to start writing (George, Moreira, 2009). Becoming an expert within one technique and finding one's own research niche is highly recommended (Riese et al., 2016). Participating as trainee editors (George, Moreira, 2009), publishing in specific trainee journals (Wasser et al., 2016) or participating in schemes of major scientific journals (Pimm, Galbraith, 2016) might also be a way to get more confident in publishing.

There are research prizes such as the EFPT forum prize (Giacco et al., 2014), the EFPT Porto Research Award or the research prize by the EPA offered to ECPs every year, acknowledging research early in their careers. These programs specifically address ECPs and acknowledge their work with small amounts of money, which they in turn can use for research endeavours. Moreover, they enable young researchers to participate in conferences to get in touch with possible mentors and other early career researchers across Europe.

Specific training programs exist that foster the teaching of research methodology. Several universities in the United States have dedicated research training programs that allow trainees to continue research while fulfilling clinical duties (Arbuckle et al., 2013, Gilbert et al., 2006, Kunik et al., 2008, Roane et al., 2009, Tsai et al., 2013). Kupfer and colleagues (2002) have stated that psychiatrists in their early careers should be motivated to do research and have access to support, mentoring and funding. They have followed up this idea by funding a specific training institute, which delivers training for ECPs interested in research and in developing their skills through workshops, booster sessions and long-distance mentoring. These kinds of motivational programs should be reinforced and implemented by institutions that specifically award clinical research funding. Furthermore, spreading these across multiple sites should be possible, such as by using web-based approaches, e-mail, teleconferences and video streaming (O'Hara et al., 2010).

The National Institute of Health has launched loan repayment programs that seemingly have fuelled newer generations of clinician researchers in the United States (Ley, Rosenberg, 2005). Clinician researchers should combine technical and management skills as well as the motivation to advance clinical work through research and vice versa (Burke et al., 1986). Such researchers can also establish a new self-understanding as basic neuroscientists and reduce the stigma of psychiatric research (Chung, Pao, 2013). Results from a study with radiological trainees show that they enhance the involvement of trainees in research substantially (Hillman et al., 1998). The inclusion and the length of participation in organised training programs also seems a very strong predictor of later involvement in academic activities (Pincus et al., 1995).

However, if such institutional programs are not feasible, projects on smaller scale can help convey basic research knowledge to ECPs (Lewis, 1991) and help researchers gain more skills and motivation, such as via regular and short meetings (Ben-Tovim et al., 1987, Dervic, Lenz & Friedrich, 2010). Some authors offer suggestions to engage trainees in scholarly projects by launching regular scientific newsletters (Aftab, Lackamp & Cerny, 2017), journal clubs and research days (Collins, Meyer & Dawson, 1999). These initiatives could be complemented by newer e-learning tools, such as the one presented by Himelhoch and colleagues (2015), who implemented a formal training course for systematic reviews and meta-analyses online. Moreover, recent initiatives of the EPA use Massive Open Online Courses (MOOCs) for the training of specific skills independent of localisation. This might also overcome financial or institutional barriers that prevent ECPs to participate, specifically if no institutional support or funding is accessible.

Probably less feasible are dedicated research posts for ECPs. Foerster and Meadows (1989) describe such a program of dedicated time, which has strongly motivated those trainees who have participated. Strydom and Higgins (2004) report a beneficial outcome of such programs; but for their success, good preparation is needed so that inexperienced trainees will not be disappointed if they cannot make enough use of their dedicated time. Clinical neuroscience centres on excellence in research and education may serve as a platform for educating trainees, PhD and postdoctoral students involved in research (Balon et al., 2006, Kupfer et al., 2009).

Harmonisation efforts in the education of psychiatrists across Europe should also consider whether the contents of training could be more research-focused (Brittlebank et al., 2016). European surveys of psychiatrists in training conducted by the EFPT show that the main concerns across Europe revolve

around discrepancies between the stated national programme and the lived experience of trainees, especially regarding the availability of specific training opportunities in aspects of service delivery and in psychotherapy, but also in research methodologies (Nawka et al., 2010). Training programs should identify, encourage and support suitable research candidates rather than primarily focus on clinical aspects of training (Chung, Pao, 2013). Moreover, existing prejudices towards patients with mental disorders and a lack of confidence in the efficacy of psychiatric treatment should be specifically targeted by the curriculum to foster interest in the field of psychiatry as a research topic (Maric et al., 2009). It seems advantageous to create exchange platforms between trainees in general medicine and psychiatry in order to facilitate a dialogue about mental health and reduce the stigmatisation associated with psychiatry, which will be discussed later in this section (Muroff, Hoerauf & Kim, 2006, Posporelis et al., 2014).

Professional psychiatric associations or governmental organisations (e.g., European Commission, 2007) should provide scholarships that focus on fostering research training with a specific interest in psychiatry (Pantovic et al., 2012). The recognition of growing demands in the field of psychiatry for research advances might motivate funding agencies to make funds in the field more readily available. Discussion on how to integrate research in paid clinical contracts on a regular basis in every-day practice has also been ongoing. In a survey in France of psychiatric trainees ($n = 603$), half of the respondents were motivated to go on to a Master's course (van Effenterre, 2011) and almost two-thirds of academics interviewed about psychiatric training considered research training to be important (van Effenterre, Hanon & Llorca, 2014). In this regard, it seems helpful to foster clinical pathways with explicit inclusion of research tracks (Bartels et al., 2010). Creating secure research careers (Silberman et al., 2012) should be a main focus of research facilities and psychiatric organisations.

As medical students are the most valuable resource of potential future researchers, specific efforts should also be made to engage them early in psychiatric research activities, such as in the aforementioned summer programs (Curran et al., 2015). Medical students should also be encouraged to attend national and international meetings of psychiatric associations (Balon et al., 2006) to ensure early involvement in research opportunities. Strategies to promote research in medical students might also include support for student interest groups, brochures, websites and other media as well as further research training opportunities such as summer courses (Abrams et al., 2003). As previous research has shown, such enrichment of teaching leads to higher interest in students in the specialty

and might also lead to a higher engagement of ECPs in research (Mortlock et al., 2017). Introducing medical students to clinical neurosciences early in medical education might allow them to view psychiatry as being formed by a team of medical experts who challenge a broad range of questions about the brain and mind functioning, as demonstrated in other neuroscience disciplines (Tieniber, Readdy, 2016). Cross-specialty teaching could open students' perspective of neuroscientific research (Reynolds et al., 2009).

Another question is if these barriers and facilitators vary in their level of influence during clinicians' training (initial vs. later years). In this respect, a study of factors that influence motivation in senior US American psychiatry trainees identified that those with high interest in research differed from those with low and moderate interest in their research plans (Silberman et al., 2012). Trainees planning research careers had a consistent pattern of interest and involvement in research, starting well before training, were overwhelmingly male and tended to have lower debt than those with less interest. The majority of trainees have had research exposure in college, but research involvement declined sharply thereafter.

Studies that deal with the question of continuous research in ECP have focused on trainees and less on specialists at the early stages of their research careers who have completed their training. A transition from trainee to fully established researcher and clinician is important to gain better opportunities for funding and access to research opportunities in the field of psychiatry (Fiorillo, Calliess & Sass, 2012). Thus, bridging the knowledge gap on research problems among ECPs may be of particular interest for future studies. More importantly, the majority of the studies conducted to date have focused on single factors that challenge research in ECPs. Future studies should use more systematic approaches, assess simultaneously various research factors identified as challenging in previous studies and use a follow-up design in identifying and assessing the useful strategies for overcoming potential research challenges.

Still, one of the barriers to conduct research in psychiatry is *not* choosing psychiatry as a specialty. One of the reasons stopping ECPs from choosing a research career in psychiatry is the stigma of the discipline, its professionals and patients, which we have not discussed here in detail. For example, it has been reported that more than 50% of British medical graduates that started their careers as psychiatrists and then discontinued it stated that 'psychiatry has a poor (public) image' (Lambert et al., 2006). In a survey among the general public, a biased view of research on people with mental health disorders was identified (Muroff et al., 2006). Most participants viewed patients as less

able to make independent decisions, leading to a tendency to restrict research in mental health as compared to other areas of medicine. Likewise, in a study focusing on medical students in Belgrade ($n = 114$), psychiatry was regarded as a discipline lacking a profound scientific basis and was a reason not to choose it as a career (Maric et al., 2009). This negative view might discourage younger researchers from continuing research. Equally, in another study in emergency medicine trainees, a lack of established research culture was identified (Olaussen et al., 2017).

Implications of these findings

The findings from this study provide a basis to address the barriers that exist for ECPs in conducting research and magnify the need to implement the facilitators. This is quite relevant, as clinically knowledgeable researchers are needed in the future to ensure the scientific basis of the discipline. On this matter, ECPs should be encouraged to identify competent mentors and to use the available opportunities offered through psychiatric associations and public funding agencies.

In this review, we have described as a whole the barriers and facilitators for ECPs to participating in research. These may differ geographically (Europe vs. North America) and economically (high-income countries vs. low-income countries), which future research could further explore. For example, countries such as Turkey might offer few research options, as in a questionnaire survey, 94 out of 107 participants expressed a wish to move abroad due to research purposes than economic reasons ($n = 68$) (Kilic et al., 2019). The majority of studies deals with the status of trainees in North America and has not assessed and compared research options for psychiatrists in other regions, such as Europe. Some ECPs move across Europe (Pinto da Costa, 2015, Pinto da Costa et al., 2017) with the explicit goal to perform research. Only few groups assessed research opportunities across other regions or countries (Sonmez et al., 2016, Parmar, Sharma & Pal, 2016) and encountered problems of funding and time in less developed regions. Countries being well-developed in terms of research tracks and funding might even 'gain brain' by welcoming research interested trainees from other countries (Vidiasagar, 2007). There is a pressing need for a systematic assessment in different European countries to investigate research activity, training in research methods and funding options. This would help targeting the most important factors that prevent ECPs in Europe from engaging in research activities. Moreover, insights into specific strengths and weaknesses of psychiatry as a research discipline might provide a key for interventions on a global as well as on a local level. More funding is expected

from European institutions and the countries of the European Union, which will provide together more than half of all official global aid (European Commission, 2017). Therefore, having a European picture would be specifically relevant. It might be of great interest for young researchers to know in which countries optimal research structures exist, and for countries with reduced capacities to receive support to offer their young researchers beneficial circumstances, so the 'brain drain' (Pinto da Costa et al., 2017) might be reduced.

To amend the lack of ECPs in research, several methods have been discussed. Such discussions included: compulsory days-off for research (Toot et al., 2012), the formulation of European guidelines by European psychiatric associations to foster research in ECP, establishing formal research methods of teaching, the funding of structured research academies in medical faculties, the implementation of structured tracks for medical trainees and the fostering of acceptance for clinical pathways by explicit inclusion of research tracks in medical training for all residents (Bartels et al., 2010, Haas, Wang, 2009). Scientific skills trainings (e.g., in writing skills (Stanley et al., 2017)) as well as specific counselling (Riese et al., 2016) can be offered to outstanding ECPs, such as within the framework of European-wide and collaborative independent research projects (Andlauer et al., 2014). ECP organisations as established by the EFPT and EPA have launched programs that aim to encourage ECPs to conduct such projects. Additionally, work by organisations such as the Association for the Improvement of Mental Health Program (Sartorius, 2018) that regularly offer skills trainings for ECP researchers, should also be acknowledged. Lastly, medical teachers have offered specific counsel for researchers in psychiatry (Goldberg, 2011, Riese et al., 2016), and create valuable guidelines for ECP researchers in psychiatry. Measures that foster independent research of ECPs and research exchanges between ECPs and senior European researchers need to be undertaken as early career steps and incentives during residency, whilst also taking into account the financial burden faced by ECPs. The stigmatisation of patients, treatment and research in psychiatry should also be actively fought against in the curricula (Maric et al., 2009), reducing self-stigmatisation of the ECP (Gaebel et al., 2015). This might result in the improvement of research performance and change negative attitudes towards research (Lewis, 1991, Mihai et al., 2006).

Nevertheless, it needs to be critically acknowledged that motivation for research activities might emerge even before residency training (Ledley, Lovejoy, 1993, Silberman et al., 2012). It has been shown that a large number of medical students are discouraged in their career plans in research

by insufficient counselling (Lehmann et al., 1992). Efforts to increase recruitment into research should centre on identifying early developmental influences, eliminating barriers specific to women or minorities (Goldstein et al., 2014), and ensuring adequate funding to provide secure careers for talented potential researchers (Silberman et al., 2012). Although research has not identified specific gender inequalities in research activities, these issues need to be addressed in future research (e.g., (Leibenluft et al., 1993)), as the number of women and minorities in research remain low (Abrams et al., 2003).

CONCLUSIONS

In this review, we have identified the main barriers for ECPs conducting research: lack of mentorship, time constraints and lack of funding. To address them, initiatives should be taken to explicitly foster research as a means to enhance medical knowledge, through dedicated research time, access to mentors and specific funding.

LIST OF ABBREVIATIONS

ECP - Early Career Psychiatrists

DECLARATIONS

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AUTHORS' CONTRIBUTIONS

KK and MP designed the study, performed the data search and data extraction. KK and MP drafted the manuscript, CP, DF, FR, OA, NJ and GL contributed to literature research and writing. All authors commented on and agreed to the final manuscript.

AVAILABILITY OF DATA AND MATERIAL

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

COMPETING INTERESTS

The authors declare that they have no competing interests.

CONSENT FOR PUBLICATION

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