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REVIEW

The effect of psychosocial interventions on infertility: Inconsistency of research data

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ABSTRACT

This systematic review aimed to investigate the inconsistency of research data concerning the contribution of systematic psychosocial interventions to infertility treatments. More specifically, the objective of this review was to investigate the cause of the contradictions in the results of contemporary research with respect to the role of systematic psychosocial interventions in the success of fertility treatments. The suspected cause of these contradictions is the heterogeneity of the relevant clinical studies with respect to their methodology. Thus, the specific aim of the current review was to evaluate the degree of heterogeneity of certain parameters in the design of the relevant clinical studies during the last decade, including sample heterogeneity, assisted reproductive technology methods, types of psychosocial interventions and methods of recording and analyzing psychometric data. This investigation may be considered imperative considering that despite the great number of relevant clinical studies and their meta-analyses, there are still no conclusive results concerning the potential of improving fertility through psychosocial support. Search for relevant studies was performed employing the PubMed and Google Scholar databases based on specific criteria. According to these criteria the selected publications have been meta-analyses of clinical studies on humans, evaluating the effect of psychosocial interventions on the success of assisted reproductive treatments during the last decade. The studies may have included all the different infertility etiologies, as well as all types of assisted reproductive treatments. The extensive search based on the specific inclusion/exclusion criteria resulted in reporting results from 6 studies in total. The clinical studies included have reported on various types of interventions for psychosocial support such as individual, couples' or group therapies performed either in facilities offering mental health services or in the form of home-based self-treatment. Moreover, these studies investigated various techniques of stress management ranging from counseling to specialized methods such as biofeedback and diaphragmatic breathing or alternative techniques such as yoga and meditation. Our results suggest that clinical studies designed specifically to evaluate the effect of systematic interventions on the efficacy of fertility treatments are limited. Moreover, their degree of heterogeneity is highly significant with respect to included participants, treatment protocols, psychosocial support techniques as well as methods for the documentation and statistical analysis of psychometric data. Consequently, the conduction of well-design clinical

studies based on strict criteria aiming to investigate specific infertility causes, similar fertility treatment protocols or particular types of psychosocial interventions is necessary in order to reach definitive conclusions.

KEYWORDS: systematic review, stress management, psychosocial intervention, Assisted Reproductive Technology, meta-analysis

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Introduction

Assisted Reproductive Technology (ART) treatment is significantly widespread due to the continuous increasing number of infertile people worldwide.¹ Infertility is a factor of psychological stress for many couples, while ART treatment is regarded painful and time consuming, leading to severe psychosocial consequences.^{2,3} This is especially true in the case of multiple failed attempts.⁴ The psychosocial consequences have been associated with depression,⁵ that affects the relationship and social life of the couple^{6,7} often leading to abandonment of reproductive treatment.⁸ According to recent studies the increasing anxiety levels lead to oxidative stress⁹ and increase of inflammatory factors¹⁰. Moreover, it has been reported that stress has influence on a variety of biological markers such as cortisol, that could results in decreased fertility.^{11,12} The influence of stress in the physiology of reproduction and its impact on the success of ART is an increasingly expanding research field.¹³ A number of studies have been conducted investigating the impact of targeted psychosocial support interventions for stress management on the success of the assisted reproduction treatments.^{12,14-18} However, despite the large number of studies and relevant meta-analyses, the potential contribution of psychosocial intervention on the improvement of ART remains unclear, mainly attributed to conflicting results. On one hand, studies by Matthiessen et al.¹⁹ and Frederiksen et al.²⁰ report a statistically significant improvement in the outcomes of infertility treatments following psychosocial support. On the other hand, Boivin et al.^{21,22} and Nicolero-Santa Barbara et al.²³ in their meta-analyses failed to report similar conclusion. Consensus point for the majority of studies, is the fact that psychosocial support presents with a positive impact on the general psychosocial welfare of women who undergo infertility treatments, regardless of the outcome of ART.^{19,20,22,24} This may be indirectly associated with the improvement of ART success rates since women with lower stress levels are less likely to abandon reproductive treatment.^{25,8} Additionally, the majority of meta-analyses reach to conflicting results due to study heterogeneity and all underline the need for further investigation. The conduction of better designed studies employing stricter inclusion/exclusion criteria is of paramount importance.^{26,27} The heterogeneity observed, may be attributed to the sample employed in each study, which consists of women whose etiology of infertility differs significantly and may range from idiopathic infertility to male or female pathological infertility. Similarly, the methods and techniques employed for stress management in each study differs significantly. These methods may be based on individual, binary or group conferences²⁶ and include a variety of techniques namely diaphragmatic respiration,^{28,29} progressive muscular relaxation,³⁰ guided visualization,^{31,32} biofeedback,^{33,34} emotional release technique,³⁵ autogenic education,³⁶ transcendental meditation,³⁷ consciousness techniques,³⁸ body-mind interaction,^{39,40} and yoga.⁴¹ Heterogeneity has been similarly reported regarding protocols of assisted reproduction, referring to homologous or heterologous genetic material, surrogate motherhood, different number of embryos transferred, as well as the statistical data evaluation methods⁴² Therefore, it may be of interest to investigate the impact of stress management on the efficacy of the infertility treatments, while taking in consideration the infertility etiologies, the psychosocial support techniques, the treatment protocols and the statistical evaluation methods. This systematic review aimed to investigate the causes of heterogeneity reported in the relevant meta-analyses of the last decade.

Material and Method

PubMed and Google Scholar were searched for relevant studies. The keywords employed for the search were: ("Infertility" OR "Assisted Reproductive Technology" OR "IVF") AND ("Psychosocial Interventions" OR "Social Support" OR "Stress" OR "Anxiety"). The search was limited for articles in English from 2000 until 2021. Only systematic reviews and meta-

analyses were included. A total of 917 articles, 562 from PubMed and 355 from Google Scholar were screened. A total of 288 duplicate studies were revealed. The inclusion criteria were the keywords of the titles to be relevant and conceptual with the content of the article, the articles to solely constitute meta-analyses or systematic reviews of clinical studies on humans. Only studies evaluating non-pharmaceutical psychosocial support interventions for women undergoing infertility treatment were included. The exclusion criteria were interventions for pathological causes for infertility, animal studies, infertility with genetic etiology or administration of pharmaceutical interventions for infertility. From the initial screening based on the titles and abstracts 588 studies were excluded as non-relevant, 14 studies focused on dealing with male infertility and 11 studies referred to pharmaceutical and surgical interventions for infertility management. Full-text articles of the remaining 12 studies were obtained. One study was excluded, as it did not contain psychosocial interventions and 5 studies did not examine, clarify or exclude the possibility that participants were receiving further psychological support. of the remaining 6 articles (Table 1) were included in the present systematic review. Data extraction on the included studies was performed in regard to the number of studies, the cause of infertility, the control of the variables for heterogeneity, the methods/techniques of the interventions employed, the ART employed, the methods for collecting psychometric data and the findings of those studies (Table 2). The data collection was performed considering the heterogeneity of the studies per outcome.

Results

The meta-analysis of Frederiksen et al.²⁰ includes 39 studies and concludes that the psychosocial interventions and especially the ones based on the Cognitive Therapy⁴³ and the Consciousness⁴⁴ seem to limit stress and improve pregnancy rates. However, it was noted that only 10 out of the 39 studies examined pregnancy rates, while publication bias in favor of studies with a significant correlation between psychosocial support and pregnancy rates was observed. When investigating the heterogeneity of the studies examined by Frederiksen et al., the infertility etiology remained unclear, considering that in numerous studies insufficient data were provided. The heterogeneity was evaluated from low to mediocre level based on I^2 test. The psychosocial interventions consisted of several different approaches and techniques, including counselling, meditation, muscular relaxation and guided visualization. In the included studies, all ART treatments were accepted. When evaluating psychometric data, all the included studies employed the pre-post design, noting a statistically significant decline in stress and depression symptoms. However, the selection methods and the statistical analysis employed were not stated in detail. Emphasis should be given to heterogeneity due to attrition bias, which in a number of studies is significantly high.

Similarly, the meta-analysis of Ying et al.⁷ included 20 clinical studies which consisted of 14 different types of interventions, including special alternative procedures such as musical therapy, hypnosis or written expression of emotions. Beyond the heterogeneity attributed to the type of intervention employed, significant heterogeneity was observed related to the timing of the application of the intervention. It should be noted that in some studies the intervention was performed prior to the initiation of the ART treatment, while in others it was performed during or towards the end of the ART treatment. It should also be highlighted that psychometric data were not collected while awaiting the results, in any of the included studies, as this time is considered quite stressful.⁴⁵ Only 10 out of the 20 studies evaluated the outcome of pregnancy rates, while only 2 out of the aforementioned 10 presented with significantly improved pregnancy rates. However, it should be also noted that the result may be again subjected to attrition bias. Moreover, it should be noted that all studies refer to in vitro fertilization treatment without clarifying possible differences in the specific protocols

that were implemented, the fertilization method employed, the number of embryos transferred or the day of the embryo transfer. The meta-analysis observed a statistically non-significant positive impact of the psychosocial interventions on the success of ART treatment.

The meta-analysis conducted by Chow et al.⁴⁶ included a limited number of studies. Specifically, 7 prospective and 5 retrospective studies of psychosocial interventions were analyzed. The majority of the included studies were randomized, controlled clinical trials but only 3 evaluated pregnancy rates as an outcome, concluding to significant,⁴⁷ marginal⁴⁸ and non-significant increase,⁴⁹ respectively. In relation to the quality of these studies Chow et al. reported that despite the robust design of the studies according to evidence-based medicine, their statistical analysis presented with weaknesses due to the small sample size and the lack of adjustment for confounders. Evaluating the pregnancy outcome, two studies reported a significant increase,^{20,27} while the remaining three concluded that the psychosocial interventions did not influence the efficiency of the infertility treatments.^{21,26,3} The study concludes that the psychosocial interventions significantly improve the mental health of the participants, while they seem to improve ART outcomes. However, a limitation of the study is that the data examined are insufficient for evaluating the different approaches of psychosocial support due to significant heterogeneity. Thus, it is considered necessary the design of clinical studies for the evaluation of the different types of interventions.²¹ Another covariate that may have significantly increased heterogeneity is the different cultural background of the participants, since the studies originated from countries with cultural differences, hence different perceptions of infertility and its psychosocial repercussion.^{50,51}

The meta-analysis of Chu et al.⁵² examined 34 studies, with pre-post design, evaluating the impact of specific non-pharmaceutical psychosocial interventions on anxiety, stress of infertility, depression and pregnancy rates following ART. Twenty-five studies reported on the pregnancy outcome and the interventions included were acupuncture, psychological support and improvement of lifestyle. According to the inclusion criteria all studies consisted of a control group, while all the initial psychometric tests were performed at the initiation of the ART treatment and the final ones were performed during the time of waiting for the pregnancy results. The heterogeneity of the studies was evaluated as significant, according to a subgroup analysis based on age, type of intervention and gender. The subgroup analysis revealed that the group interventions presented with enhanced results compared to the individual ones, even though evaluation per kind of intervention could not be performed due to the limitation of the sample size. More specifically group interventions presented with improved stress management, but also a steady but non-significant increase on pregnancy rates. The fact that the increase of pregnancy rates was not statistically significant – in disagreement with prior meta-analyses^{27,26,20} – was attributed to the stricter inclusion criteria as solely randomized, controlled trials reporting on ART outcomes were selected. Studies investigating the impact of psychosocial interventions on mental welfare without reporting on ART outcomes were excluded.

The meta-analysis of Massaro et al.⁵⁰ included 11 studies examining the impact of psychosocial interventions on the mental and emotional welfare of women undergoing IVF. Only studies that the intervention was initiated prior to the IVF cycle were included. From the 11 studies, only 5 reported on the impact of the interventions on the IVF cycle result. Significant heterogeneity was observed when evaluating the studies, originating from the study design, the methodology and the statistical analysis performed. Further to this, a number of studies did not clearly present the psychosocial interventions and did not clarify the methodology of psychometric data recording. It is noted, however, that the meta-analysis does not provide cumulative statistical data, but examines each study individually, resembling more to a systematic review than a meta-analysis. However, the 5 studies reporting on IVF outcomes are relatively homogenic, as they are randomized controlled trials including the

necessary psychometric data.^{49,53-56} The studies reporting on IVF outcomes present with similar pregnancy rates between the intervention and control groups.

Finally, the meta-analysis of Gaitzsch et al.³⁹ includes 12 studies and assessing the impact of the body/mind interaction interventions on mental health of infertile women and on the efficacy of infertility treatments. Body/mind interaction interventions and the provision of psychometric data for stress, depression, life quality and married life of the participants, were the inclusion criteria of this meta-analysis. The included studies were not necessarily either randomized or controlled. Therefore, results were subjected to significant heterogeneity, and statistical analysis could not be performed in a number of outcomes. In cases presenting with significantly high heterogeneity a systematic review was performed. Moreover, significant heterogeneity was observed in infertility etiologies and duration, age of the participants, and the type of ART treatment employed. Moreover, insufficient data were presented regarding the interventions and the contingent infertility treatments. Six studies reported on pregnancy rates, while only 2 of them reported significant improvement. The findings of the study should be interpreted with caution due to significantly high heterogeneity and the limited sample size.

Discussion

The aim of this systematic review was to investigate the impact of heterogeneity and statistical bias of studies included in past meta-analyses, as the most probable causes of the unclear results reported regarding the evaluation of the psychosocial interventions in the improvement of ART outcome.^{26,27} One observation of this systematic review is the limited results uncovered during the search for relevant meta-analyses. Only 6 meta-analyses fulfilled the inclusion criteria that included 128 studies with only 64 of them reporting on pregnancy rates (Table 2). Hence, despite the plethora of studies regarding the psychosocial health of infertile couples, the ones that focus on the improvement of fertility through psychosocial support are inadequate for reaching robust conclusions. Evaluation of results may be even more challenging when investigating the heterogeneity of the individual characteristics of the included studies. Examining the main causes of heterogeneity, the infertility etiology is neither examined nor mentioned in the meta-analyses by Ying et al., Chow et al., Chu et al. and Massaro et al. analysed herein. The meta-analysis by Frederiksen et al. does not provide adequate data regarding the main causes of heterogeneity, while in the meta-analysis by Gaitzsch et al. the duration of infertility is regarded as the main cause of heterogeneity. It has been highlighted that the infertility etiology plays a primary role to ART success. Similarly, the duration of infertility is deemed as equally important, since women with long term infertility present with a diminished psychological profile.^{27,17} The attempts to perform a meta-analysis were hindered by the fact that the majority of studies included presented with high heterogeneity and statistical bias. Thus, Massaro et al. and Gaitzsch et al. opted to perform a systematic review instead of a meta-analysis as statistical evaluation was not possible, due to high heterogeneity. Frederiksen et al. reported a low to mediocre degree of heterogeneity, while Chu et al. reported significantly high heterogeneity. Ying et al. discussed the heterogeneity and the lack of statistical precision due to sample size, as well as due to attrition bias observed in a number of studies. The cultural background of the participants as a cause of heterogeneity is highlighted in the studies of Chow et al. and Massaro et al. This may be attributed to the fact that the included studies originate from different countries, in which the degree of acceptance of different types of psychosocial interventions or their perceptions of infertility may vary.⁵¹ Significant heterogeneity is also observed in the types of interventions that are included in the meta-analyses. The meta-analysis by Ying et al. includes 14 different types of psychosocial interventions in 20 studies, while the meta-analysis by Gaitzsch et al.

focusses solely on the body/mind interaction interventions. Another significant causation of heterogeneity is the methodology of infertility management, that ranges from lack of employment of ART to IVF. It should be emphasized that, even the meta-analyses including solely studies with IVF (Ying et al., Massaro et al.), the specific protocols applied may vary significantly regarding the number of embryos transferred, the day of embryo transfer or the employment of homologous or heterologous genetic material used.⁴² Concerning the reporting of psychometric data, significant heterogeneity is observed regarding the synchronization of the interventions and the timing of data recording, in comparison to the initiation of ART treatment. In the meta-analysis by Ying et al. only studies that did not perform psychometric evaluation following embryo transfer, albeit prior to pregnancy evaluation, were included, as this is considered quite tense time period.⁴⁵ The meta-analysis by Chu et al. included solely studies that the final psychometric tests were performed exclusively on the aforementioned timeframe. Further heterogeneity causations observed were the age of the participants, the participation of the spouses/partners in the interventions, the demographic characteristics and the definition of the positive outcome of the ART treatment.

One important finding of this systematic review is the limited number of well-designed studies. The significant heterogeneity observed does not allow for definitive conclusions regarding the impact of the psychosocial interventions on the efficacy of ART treatment. The conduction of novel, better designed, randomized controlled trials, with stricter inclusion and exclusion criteria, as well as better defined outcomes is required. Furthermore, novel meta-analyses of the existing studies based on more specific selection criteria aiming to investigate studies with more homogenic characteristics would possibly enable better evaluation of the existing evidence.

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Figure 1. Diagram of the article selection flow

Table 1. Summary of the results

Bibliographic report	Number of studies	Etiology of infertility	Heterogeneity of studies	Method/technique of stress management	Method/protocol of assisted reproduction	Psychometric data	Findings of study
Frederiksen et al., 2015	39 (10 examine pregnancy percentages too).	It could not be clarified in the total of the studies in order to clarify the degree of heterogeneity.	Low to mediocre heterogeneity based on I ² test.	Psychosocial interventions (individual, couples, group) including the counselling, meditation, muscular relation, guided visualization etc.	All the ART methods including the IVF. The degree of heterogeneity of the protocols is not clarified.	Psychometric tests for infertility stress, depression, anxiety and balance of married life, before and after the intervention, with or without a control group. A significant decrease of stress and depression was noted.	The psychosocial interventions and especially the CBT and MBI seem to limit stress and to improve significantly the probabilities for a pregnancy. It is noted that a publication bias is observed in favor of studies with positive correlations, the pooling of which ends up with a non-significant correlation.
Ying et al., 2016	20 (10 examine pregnancy percentages too).	It is not examined, it is not mentioned.	The quality of the methodology was deemed satisfying in most studies based on specific quality criteria. Difficulty in the analysis came up from the heterogeneity of the number of participants who withdrew in some studies.	14 different types of intervention including beyond the most common and music therapy, written expression of emotions, hypnosis.	IVF without a clarification on the degree of homogeneity of the applied protocols.	Psychometric tests for infertility stress, depression, anxiety and social consequences, before and after, with or without a control group. No measurements were done during the waiting for the results.	Reference on the positive impact of the interventions on the pregnancy rates but without statistical analysis or emphasis.
Chow et al., 2016	12 (8 examine pregnancy rates).	It is not examined, it is not mentioned.	The heterogeneity in the cultural background of the participants is commented on.	Psychosocial interventions (individual, couples, group) including the counselling, meditation, muscular relation, guided visualization etc.	All the ART methods including the IVF. The degree of heterogeneity of the protocols is not clarified.	Heterogeneity in the time of implementation of interventions and transcription of psychometric data.	Reference on the positive impact of the interventions on the pregnancy rates but without statistical analysis or emphasis.
Chu et al., 2017	34 (25 examine pregnancy rates).	It is not examined, it is not mentioned.	Significant heterogeneity based on I ² test. Selection of only RCT studies.	Non-pharmaceutical psychosocial interventions including acupuncture, psychotherapy, improvement of lifestyle.	All the ART methods including the IVF. The degree of heterogeneity of the protocols is not clarified.	Implementation of interventions and initial psychometric tests after the initiation of ART. Final measurements during the waiting	Non-significant positive impact of psychosocial interventions on the success of assisted reproduction treatments on younger ages and

						time for the ART results.	on group interventions compared to individual interventions.
Massaro et al., 2018	11 (5 examine pregnancy rates).	It is not examined, it is not mentioned.	The studies are examined individually without the cumulative statistical data being listed. Cultural heterogeneity since it includes participants from various different countries. Significant heterogeneity of demographic characteristics.	Sole participation of women with subsidiary activities of psychosocial support such as yoga, counselling or acupuncture.	IVF without a clarification on the degree of homogeneity of the applied protocols.	Initiation of interventions prior to the initiation of IVF.	Similar pregnancy rates are mentioned in the intervention groups compared to the control groups, even though the study is not focused on the correlation between the psychosocial support and the successful outcome.
Gaitzsch et al., 2020	12 (6 examine pregnancy rates).	Heterogeneity when referring to the etiology and the amount of time for the infertility diagnosis.	The data of the studies were considered to a significant degree as heterogenous or incomplete so their cumulative statistical analysis was not possible.	Body-mind interaction interventions (yoga, consciousness techniques, etc.).	Heterogeneity of fertility improvement and assisted reproduction methods.	Psychometric data related to stress, depression, life quality and married life quality.	A positive impact of the interventions on the mental welfare, the quality of life and the quality of married life is reported. A possible improvement of the pregnancy rates is mentioned.

ΑΝΑΣΚΟΠΗΣΗ

Η επίδραση των ψυχοκοινωνικών παρεμβάσεων στη γονιμότητα: Η διχογνωμία των επιστημονικών δεδομένων

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ΠΕΡΙΛΗΨΗ

Σκοπός της παρούσας βιβλιογραφικής ανασκόπησης ήταν η διερεύνηση της διχογνωμίας των αποτελεσμάτων της σύγχρονης έρευνας για τη σχέση μεταξύ της βελτίωσης της ψυχικής ευεξίας υπογόνιμων ζευγαριών μέσω συντονισμένων ψυχοκοινωνικών παρεμβάσεων, με τη βελτίωση των ποσοστών επιτυχίας θεραπειών υπογονιμότητας. Η διχογνωμία των αποτελεσμάτων στο ερευνητικό αυτό πεδίο πιθανολογείται ότι οφείλεται στην ετερογένεια των μελετών ως προς τον σχεδιασμό τους και τις μεθόδους ανάλυσης δεδομένων. Η συστηματική αυτή ανασκόπηση επιχειρεί να αξιολογήσει τον βαθμό ετερογένειας καίριων παραμέτρων μελετών της τελευταίας δεκαετίας όπως την ετερογένεια δείγματος, μεθόδων υποβοηθούμενης αναπαραγωγής, τύπων ψυχοκοινωνικών παρεμβάσεων και μεθόδων καταγραφής και ανάλυσης ψυχομετρικών δεδομένων. Η εν λόγω διερεύνηση κρίνεται σκόπιμη δεδομένου ότι ενώ ο αριθμός των σχετικών κλινικών μελετών και των μετα-αναλύσεων τους είναι μεγάλος εξακολουθεί να υπάρχει αδυναμία διεξοδικής αξιολόγησης της δυνατότητας βελτίωσης της γονιμότητας μέσω ψυχοκοινωνικής στήριξης. Η αναζήτηση άρθρων έγινε μέσω των ηλεκτρονικών βάσεων αποδελτίωσης βιβλιογραφικών δεδομένων PubMed και Google Scholar. Σύμφωνα με τα κριτήρια που τέθηκαν τα άρθρα επιλογής έπρεπε να αποτελούν μετα-αναλύσεις κλινικών μελετών για την επίδραση συντονισμένων ψυχοκοινωνικών παρεμβάσεων στην αποτελεσματικότητα θεραπειών υποβοηθούμενης αναπαραγωγής της τελευταίας δεκαετίας. Οι μετα-αναλύσεις αφορούσαν σε όλες τις αιτιολογίες υπογονιμότητας, καθώς και όλων των ειδών τις μεθόδους υποβοηθούμενης αναπαραγωγής. Κατόπιν αναζήτησης και επιλογής βάσει συγκεκριμένων κριτηρίων η διαδικασία κατέληξε στην επιλογή 6 άρθρων. Τα άρθρα αυτά αφορούσαν σε μετα-αναλύσεις μελετών διαφόρων τύπων παρεμβάσεων ψυχοκοινωνικής στήριξης όπως ατομικές, ζευγαριού, ομαδικές είτε σε επαγγελματικό περιβάλλον παροχής υπηρεσιών ψυχικής υποστήριξης είτε με τη μορφή προσωπικής αυτοβελτίωσης. Επιπλέον τα άρθρα αφορούσαν σε διάφορες τεχνικές και μεθόδους διαχείρισης stress που ποίκιλλαν από τη συμβουλευτική έως τη χρήση εξειδικευμένων τεχνικών διαχείρισης stress όπως η βιοανάδραση ή η εκμάθηση τεχνικών αναπνοής, αλλά και εναλλακτικές μεθόδους όπως η γιόγκα και ο διαλογισμός. Γενικό συμπέρασμα της συγκριτικής ανασκόπησης είναι ότι ο αριθμός των συστηματικών κλινικών μελετών που επικεντρώνονται αποκλειστικά στη διερεύνηση της επίδρασης στοχευμένων ψυχοκοινωνικών παρεμβάσεων στην επιτυχία θεραπειών υποβοηθούμενης

αναπαραγωγής, είναι τελικά σχετικά περιορισμένος, ενώ στη μεθοδολογία τους εντοπίζεται σημαντική ετερογένεια ως προς τη δειγματοληψία, τα πρωτόκολλα θεραπείας, τις τεχνικές ψυχοκοινωνικής στήριξης, τις μεθόδους καταγραφής ψυχομετρικών δεδομένων αλλά και τις μεθόδους στατιστικής ανάλυσης δεδομένων. Συνεπώς, απαραίτητος κρίνεται ο σχεδιασμός συστηματικών τυχαιοποιημένων, ελεγχόμενων μελετών βάση αυστηρών κριτηρίων, οι οποίες να στοχεύουν στη διερεύνηση της διαχείρισης stress για την αντιμετώπιση της υπογονιμότητας αναφορικά με συγκεκριμένες αιτιολογίες υπογονιμότητας, ομοιογενή πρωτόκολλα υποβοηθούμενης αναπαραγωγής και συγκεκριμένους τύπους ψυχοκοινωνικών παρεμβάσεων.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: συστηματική ανασκόπηση, διαχείριση στρες, ψυχοκοινωνική παρέμβαση, μέθοδοι υποβοηθούμενης αναπαραγωγής, μετα-ανάλυση

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