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The Effect of Group Counseling based on Acceptance and Commitment Therap on Sexual Satisfaction among women with HIV or women with HIV-positive Partners: A Parallel Randomized Controlled Clinical Trial

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ABSTRACT

Background & aim: Half of individuals living with HIV experience a decline in their quality of life due to sexual issues. This study aimed to determine the effect of group counseling based on ACT on sexual satisfaction among women with HIV or women with HIV-positive partners.

Methods: This parallel-randomized controlled clinical trial was carried out on 32 women with HIV or women with HIV-positive attended the Behavioral Disease Counseling Center in Yazd and Meybod, Iran. Participants were randomly assigned to two groups. One group comprised 16 participants who attended ten weekly 2-hours sessions, while the other group underwent routine counseling at the center. The study used Demographic information and sexual satisfaction questionnaires, which completed 2018 September. Data analyzed using Chi-square, independent t-test, and repeated measures ANOVA with SPSS software Version 16.

Results: The demographic variables between the two groups did not show any significant difference. The intervention group demonstrated significant differences in average sexual satisfaction scores before, after, and one month after the intervention (90.87±13.3, 96.31±12.94, and 97.81±12.52), respectively. However, the control group did not exhibit significant differences in sexual satisfaction scores (83.93±18.07, 84.87±17.49, and 85.06±16.70).

Conclusion: The study reveals that ACT can increase sexual satisfaction among women with HIV or women with HIV-positive partners. By empowering affected women exposed to HIV through the use of ACT, patients' sexual satisfaction can be significantly improved.

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Introduction

The global prevalence of human-acquired immunodeficiency virus (HIV) stands at 35 million individuals, and this figure is steadily rising. According to a report by UNAIDS in 2022, the number of individuals residing in Iran with HIV was estimated to be 64,000, with women accounting for 22,000 of this population (1). The clinical manifestations of AIDS vary greatly and are influenced by a multitude of factors such as age, sex, race, geographical location, treatment, and behavioral habits of the patient (2). Societies exhibit varying attitudes towards individuals infected with HIV/AIDS, with many displaying negative attitudes that are often accompanied by discriminatory behavior (3). Individuals diagnosed with HIV/AIDS frequently encounter

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the distressing effects of stigma, along with feelings of anxiety, hopelessness, depression, stress, and a compromised quality of life (4-6). The psychological aspects of AIDS have not received sufficient attention, as the efforts and measures in fighting this disease have primarily concentrated on treatments and medical care. Sexual dissatisfaction is a neglected psychological aspect that poses a significant challenge for women who are HIV-positive (7-8). A UK study found that 60% of HIV physicians rarely/never ask their female HIV patients about sexual function (9). The disease's discriminatory effects cause people to conceal their illness from their sexual partner, leading to increased distance and dissatisfaction in the relationship (3, 10). The patient's defenselessness against harm, including failure to disclose the disease, non-compliance with condom usage, and feelings of guilt, is exacerbated by both cultural and social restrictions, as well as ineffective sexual health policies (11). The patients employ diverse tactics to protect and steer their sexual lives, such as refraining from engaging in sexual activities to evade the demands and hazards associated with revealing their HIV status to their sexual companions. Being subjected to enforced seclusion from society, this group is susceptible to the influence of gender, emotional, or financial conventions, rendering them vulnerable within relationships. In situations where women have partners who are sick or infected and do not use condoms to prevent transmission, they may choose to refrain from engaging in sexual activity (12). This decision may be driven by the fear of contracting the illness, which could result in violence or sexual dissatisfaction. Sexual satisfaction plays a crucial role in determining the quality of a relationship, and it has significant implications for sexual and reproductive health as well as HIV prevention, care, and treatment (13-14). There is a compelling requirement to utilize psychological interventions to enhance the sexual quality of life for this group, given the improvements in disease management. A study conducted in the United States in 2009 examined the effectiveness of behavioral interventions on HIV-infected African-American women. The findings revealed that either the researched community exhibited minimal sexual activity or had a low sexual satisfaction level. This issue was attributed to the stigma associated with the disease, which had a profound influence on their sexual behavior (10).

In Carter et al. (2018) in a research titled "advocating for the sexual rights of HIV-infected women", found that the emphasis on protecting others has overwhelmed women's concerns regarding their sexual health. Additionally, approximately 60 percent of women reported rarely or never engaging in sexual activities, indicating their dissatisfaction with their relationships (15). In 2019, a comprehensive analysis revealed that approximately 50% of individuals with HIV experience sexual dysfunction. Huntingdon 2020 explores factors causing sexual dissatisfaction among HIV-positive individuals, highlighting the need for further research to develop theoretical frameworks for improving sexual well-being. This study offers valuable insights to effective interventions and further investigations in this area (14). Treating and providing necessary psychological support to patients with specific psychological traits is crucial for their survival (10, 15-16).

Acceptance And Commitment Therapy (ACT), an innovative and practical approach, is one of method that can be employed for psychological support. This method combines four approaches: awareness, acceptance, commitment, and behavioral change. ACT is built upon three essential elements: (A) recognizing thoughts and emotions and existing in the present moment, (B) deciding on a worthwhile course, and (C) carrying out actions. The core principle of ACT, a form of behavioral therapy, is focused on the idea that actions should be aligned with one's values to facilitate behavioral transformation through motivation and inspiration. Furthermore, this approach revolves around deliberate focus, an intentional action done consciously. Additionally, embrace all aspects beyond your influence and remain dedicated to the elements that bring fulfillment to your life (17).

The primary objective of this approach is to create psychological adaptability. This entails developing the capacity to make informed decisions based on individual preferences, rather than resorting to choices solely intended to evade thoughts, emotions, and memories. By adopting this approach, individuals can acquire

the skill of refraining from attempting to eliminate the contents of their thoughts. Instead, it involves accepting and embracing these thoughts to conceptualize one's past and future experiences (18). In a pilot study conducted by Josephson (2012), the impact of ACT on women with HIV was examined, revealing its potential to enhance the psychological well-being associated with the disease and increase self-acceptance (19). In a study conducted by Østergaard et al. (2018), it was reported that a treatment package consisting of meaning therapy, ACT, and family psychological training proved to be successful in addressing the detrimental self-perception and depression experienced by individuals living with HIV/AIDS (20). The findings of Ishola et al. in 2015 revealed that the utilization of an ACT program delivered via mobile phones could result in increased psychological resilience among women who are living with HIV (21).

The study conducted by Hosseini et al. (2019), titled "acceptance and commitment therapy for increasing marital satisfaction", demonstrated the efficacy of this approach in improving the satisfaction levels of Iranian couples under investigation (22). Zahedi et al. (2021) conducted a study to evaluate the impact of ACT and CBT-based treatments (Cognitive Behavioural Therapy) on the level of marital satisfaction among women experiencing sexual dissatisfaction. The findings indicated that while both approaches were superior to the control group, the ACT treatment exhibited a more pronounced impact on marital satisfaction compared to the CBT treatment. Hence, it is suggested by researchers that therapists employ acceptance and commitment therapy to address the issue of sexual dissatisfaction among couples (23). Given the absence of any existing research on the impact of ACT on the sexual satisfaction of women with HIV or women with HIV-positive partners and taking into account the aforementioned benefits of ACT, this study was conducted to examine the influence of group counseling using the ACT approach on the sexual satisfaction of.

Materials and Methods

A parallel-randomized controlled clinical trial was conducted on 32 women with HIV or women with HIV-positive partners attended the Behavioral Disease Counseling Center in Yazd and Meybod, Iran. The study was registered in Iranian Registry of Clinical Trials (IRCT) under code of IRCT20181213041956N1. The sampling procedure entailed the selection of two counseling centers that provide services for behavioral diseases, located in two cities of Yazd and Meybod within the Yazd province in central Iran. Due to the absence of a comparable study to determine the sample size, initially a preliminary study was conducted. This pilot study included six patients and the convenience sampling was subsequently utilized to select the participants based on estimations. Women who were at risk of HIV and had been referred to behavioral disease counseling centers in Yazd province, including those who were HIV-positive or had infected spouses, were included in the study from the statistical population.

The first researcher was in charge of inviting individuals to participate in the study and selecting the sample. The individuals who were well-informed about the executive procedures and terms of involvement in the study exercised their free will to either participate or refuse from participating in the research study.

The research invited clients based on the inclusion and exclusion criteria. A biostatistician outside the research team accessed a computer-based table of random numbers at http://www.randomization.com to create two intervention and control groups. The research encompassed a group of 32 individuals, taking into account the sample size and the population of each center (12 participants from Meybod Center , while 20 participants from the Yazd Center) (Figure 1). The explicit nature of intervention made blinding impractical.

The eligibility criteria encompassed Iranian citizenship, residency in Yazd or Meybod, being a woman of reproductive age, either being HIV positive or having a spouse who is at risk of HIV, being married and having only one sexual partner, and not being involved in any other sexual consulting class. The criteria for exclusion encompassed the following: utilization of medications that have an impact on sexual performance, pregnancy, sexual dysfunction in oneself or one's partner, unexpected occurrences such as illness or death, psychiatric or physical ailments that are incurable within the past year, and the use of psychedelics within the past year.

The criteria for dropout comprised various factors, such as unexpected events like accidents, deaths, or migration, as well as instances where individuals declined to continue receiving care at the center. Additionally, missing three or more therapy sessions, non-compliance with questionnaire completion, and failure to complete assigned homework were also considered indicators for dropout.

The data collection instruments comprised of a demographic questionnaire and Larson's questionnaire on sexual satisfaction. The demographic questionnaire comprised various demographic information about women, including their HIV status, age, education, and occupation, as well as their spouse's age, education, and occupation, duration of their marriage, and the number of children they have. The sexual satisfaction questionnaire, formulated by Larson et al. in 1998, is composed of 25 questions and employs a 5-point Likert scale to gauge the overall sexual satisfaction. The questions were answered on a Likert scale of 1 to 5. The responses were categorized as 5 :(never: 1, rarely: 2, sometimes: 3, often 4, and always: 5). Questions 1-2-3-10-12-13-16-17-19-21-22 and 23 were scored in ascending order, whereas the scoring of other questions was done in reverse order. The scores span from 25 to 125 and have been categorized as follows: scores below 50 indicate sexual dissatisfaction, scores between 51 and 75 indicate low satisfaction, scores between 76 and 100 indicate moderate satisfaction, and scores above 101 indicate high satisfaction. It should be noted that in the research conducted by Shams Mofrahi et al. (2010) titled "Examining the Impact of Marital Counseling on Couples' sexual satisfaction ," the questionnaire's validity and reliability were documented as 0.90 and 0.86, respectively(24). Furthermore, Bahrami et al. (2016) conducted a study examining the correlation between SS and depression in both fertile and infertile couples. The questionnaire used in this research demonstrated high reliability, with Cronbach's alpha coefficients of 0.93 for the fertile group and 0.89 for the infertile group (25).

Participants then completed the informed consent form, demographic profiles, and the Larson sexual satisfaction questionnaire to participate in the project. The researcher was actively involved in overseeing the completion of this task, and any ambiguity that arose was promptly addressed by providing answers to their questions. In two instances, informed consent was obtained from a participant who was illiterate and another participant who had severe hand tremors. To ensure their participation, their fingerprints were recorded. Subsequently, an independent witness, under the researcher's supervision, read the questions to the participants and recorded their answers in the questionnaires.

The analysis of articles (22-23) involved the inclusion of two distinguished professionals in the field of reproductive and sexual health. One of these experts possessed a Ph.D. in midwifery, while the other specialized in ACT psychiatry. Together, they collaborated to design counseling sessions, which are detailed in Table 1.

The Intervention group participated in a comprehensive program consisting of eight sessions, each lasting 120 minutes. These sessions were scheduled in the morning and were conducted as a group once a week at each center individually. The treatment sessions were meticulously designed based on the ACT treatment plan, focusing on acceptance and commitment. Following the completion of the sessions, two additional compassion-based therapy sessions were conducted for the participants, taking into account their reception and the evaluation of the research team's professors. These sessions aimed to achieve the following objectives: Understanding the objectives and regulations of a group, conducting a psychological examination of sexual relationships, elucidating values, conceptualizing ACT by identifying ineffective methods of thought control employed by individuals, identifying cognitive adaptation strategies, familiarizing oneself with the notion of creative helplessness in sexual relationships, and articulating the concept of ego control and regulation. Acknowledging thoughts and feelings, cognitive dissonance, practicing self-observation in the present moment, practicing mindfulness, and evaluating obstacles to comprehending personal values, commitment, and actions in one's sexual life. At the end of each session, the participants were provided with assignments that corresponded to the session's

content. Subsequently, they were encouraged to express their viewpoints regarding their emotions, thoughts, and other relevant aspects. The control group did not undergo any treatment and instead received standard counseling, which included family counseling, child counseling, methadone therapy, communication skills, treatment adherence, etc. These routine counseling sessions, occasionally conducted via telephone, typically lasted between half an hour to an hour. The subjects covered in the sessions are determined by the patient's requirements and the responses to their inquiries. Generally, discussions about sexual health were not addressed during regular sessions due to the negative connotations attached to it.

The data analysis for statistical purposes was carried out using SPSS software Version 16. To determine the normality of the data, the Kolmogorov-Smirnov test was employed. Different statistical tests were employed to measure sexual satisfaction, including the Independent T-test, chi-square, repeated measures-ANOVA, and Bonferroni post hoc test. A P-value below 0.05 was deemed significant.

Table 1. General content of group counseling sessions

Session	Sessions Content	Home Works
First session	Introducing group members (using an icebreaker approach). Explaining the rules, principles, and conventions that govern counseling sessions, such as respect, confidentiality, and informed consent of group members to perform the treatment process, and drafting a table to create treatment goals for the ABC analysis.	Draw the ABC table
Second session	Introducing "creative helplessness"	Practice fighting and fighting with your wife
Third session	People respond to their expectation methods by saying, "Waiting is the problem, not the solution."	Diary of pure and impure experience, desire and discomfort
Fourth session	Teaching individuals to accept unpleasant thoughts and emotions without mixing them by employing metaphors from various perspectives.	Psychological space practice (acceptance practice)
Fifth session	Performance appraisal, examining one's experiences from the previous session to date; examining homework assignments, fault training, or getting rid of unpleasant sensations using chess metaphors, soldiers' parades.	Writing down thoughts and practicing letting go of them
6th session	Relationship to the present and mindfulness training (emotional awareness and knowledge)	Using the time-out technique by each couple during arguments
7th session	Clarifying values with the dart metaphor. A director's metaphor. The Metaphor of A Life Movie	Write what she wants in her current life (determining 10 personal values of life).
8th session	Commitment training and relapse prevention, committed practice evaluation, training in barley therapy to be a therapist	Practicing self-healing
9th and 10th sessions	Teaching ACT concepts with a compassionate spice at the end of the tenth session. A summary of the content of the pre-intervention sessions was delivered at the end of the tenth session, followed by the intervention.	-

Results

The study invited 48 women to participate and undergo assessment for the inclusion and exclusion criteria. Out of the total, 13 women were excluded for not meeting the inclusion criteria, while three women refused to participate in the research. Eventually, the study included 32 women who met the eligibility criteria (Figure 1). The demographic variables, such as age, spouse's age, female and spouse's education, length of marriage, and number of

children, were subjected to statistical analysis using the independent sample t-test and chi-square test.

The intervention group had a mean age of 36.8±8.1, while the control group had a mean age of 34.5±10.31. Additionally, the mean age of spouses in the intervention and control groups were 40.13±7.46 and 38.63±9.39, respectively. At the beginning of the study, both groups exhibited homogeneity concerning demographic factors and primary variables (Table 2).

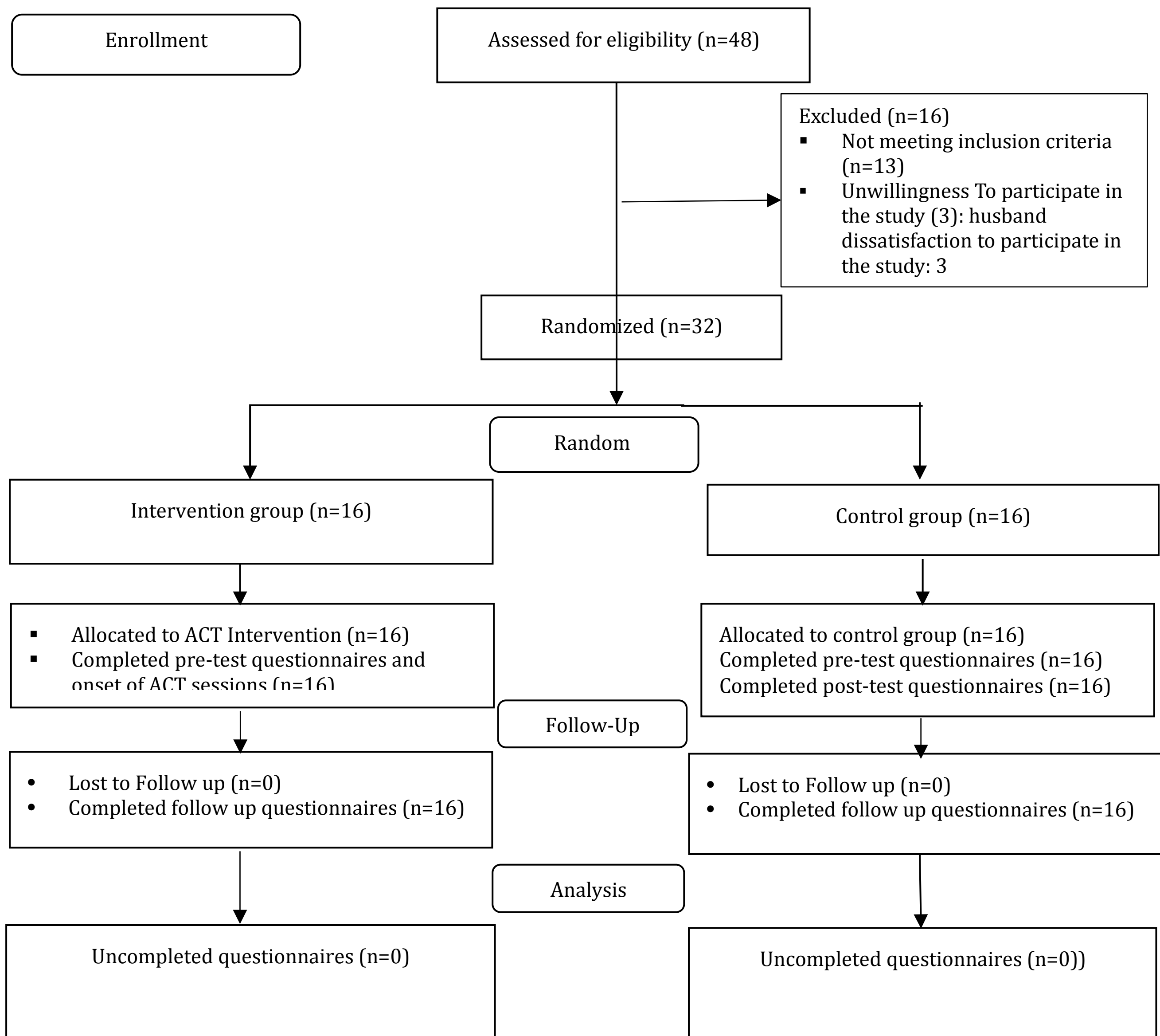

Figure 1. Flowchart of the study

In the intervention group, the average and standard deviation (SD) of the sexual satisfaction score increased from 90.87±13.39 before the intervention to 96.31±12.94 and 97.81±12.52 after the intervention and follow-up, respectively.

Table 2. Demographic characteristics of participants in the intervention and control groups

Variable	Control Group Frequency (%)	Intervention Group Frequency (%)	P-Value*
Educational level			
High school	9 (28.1)	8 (25)	1.00
Academic	7 (21.9)	8 (25)	
Spouse education			
High school	11(34.4)	14 (43.8)	0.394
Academic	5 (15.6)	2 (6.2)	
General life satisfaction			
Yes	9 (28.1)	5 (15.6)	0.285
No	7 (21.9)	11 (34.4)	
General sexual satisfaction			
Yes	7 (21.9)	10 (31.2)	0.749
No	9 (28.1)	6 (18.8)	
variable	Mean ± SD	Mean ± SD	P-Value**
Age of woman	36.88 ± 8.1	34.5 ± 10.31	0.476
Age of spouse	40.13 ± 7.46	38.63 ± 9.39	0.621
Duration of marriage	12.13 ± 9.08	9.62 ± 7.06	0.391
Number of children	1.69 ± 0.95	1.63 ± 089	0.848

* chi-square ** Independent t- test

According to the repeated measures ANOVA, a notable distinction was observed in the sexual satisfaction score among the intervention group at the baseline, immediately after counseling, and follow-up sessions (F= 8.562, P= 0.008). The post hoc test revealed a significant difference in the sexual satisfaction score when comparing the baseline with the scores immediately after counseling (P= 0.019) and one month after the intervention (P= 0.006). Before the intervention, the average and standard deviation of the sexual satisfaction score in the control group was 83.93±18.07. Following the intervention and subsequent follow-up, these scores increased to 84.87±17.49 and 85.06±16.70, respectively. Nevertheless, it is worth mentioning that these changes did not reach statistical significance (p=0.343). The results of an independent t-test indicated no significant differences in the sexual satisfaction score between the intervention and control groups before the intervention (P= 0.277). However, the intervention and control groups exhibited a significant difference in their scores immediately after counseling (P= 0.044) and one month after counseling (P= 0.021) (Table 3).

Table 3. Comparison of mean score of sexual satisfaction before, after and one month after intervention in two groups

Time / Group	Before intervention (Base line) Mean ± SD	After intervention (10th week) Mean ± SD	One month after intervention (follow-up) Mean ± SD	F	P-Value # (Repeated Measure (ANOVA)
Intervention Group	90.87 ± 13.39	96.31 ± 12.94	97.81 ± 12.52	8.562	0.008
Control Group	83.93 ±18.07	84.87 ± 17.49	85.06 ± 16.70	1.008	0.343
T	3.851	3.43	3.393		
P-Value*	0.277	0.044	0.021		

*Independent sample t- test # Repeated Measure ANOVA

Discussion

The primary objective of this study was to investigate the impact of group counseling, which was rooted in ACT on the sexual satisfaction experienced by women infected with HIV and women whose husbands were HIV positive. According to the findings of the current study, this intervention has the potential to enhance sexual satisfaction among women living with HIV as well as in women whose husbands are HIV positive. The results indicated a significant increase in the average score of sexual satisfaction in the intervention group as compared to the control group immediately following the intervention. Additionally, the intervention group experienced a noteworthy improvement in the average score of sexual satisfaction both before and immediately following the intervention. Furthermore, a substantial increase in the average score of sexual satisfaction was observed in the intervention group when comparing the scores before the intervention and one month after its implementation. Consequently, it can be surmised that the influence of ACT counseling remained consistent for women even after a month of the sessions. There was no significant difference in the average score of sexual satisfaction immediately after the intervention compared to one month after the intervention. Given the absence of studies with precise samples, interventions, and/or measured variables in the discussion, the research team opted to rely on studies that bore the closest resemblance to the present research. In semi-experimental research conducted by Kohi Kamali et al. (2019), a group of 40 infertile women was assessed using ACT-based treatment. The evaluation included the utilization of the Hudson-Harrison Marital Satisfaction Questionnaire. The research design incorporated pre-test, post-test, and follow-up assessments, with a control group (26). Despite variations in the statistical population, number of participants, and questionnaire type compared to the current study, the findings indicated that the effectiveness of ACT in increasing marital satisfaction among infertile couples remained consistent with the present research. Sarminejad et al. (2017) conducted a randomized controlled trial to examine the impact of ACT on the sexual satisfaction of 40 injured couples who sought psychological treatment in Shiraz City. By employing the Larson sexual satisfaction questionnaire, the data was collected and analyzed, revealing that ACT teaches women to accept their husbands as they are, without subjecting them to judgment, humiliation, insults, or comparisons (27). Despite the differences between the aforementioned study and the current study, such as their heterogeneity and the absence of an HIV positive population, both studies substantiated the significant impact of ACT training in increasing sexual satisfaction.

A study conducted by Moarefi et al. (2018) examined the impact of ACT in increasing the sexual satisfaction of married women experiencing symptoms of dissatisfaction. The research focused on a group of 30 individuals who sought counseling services in Tehran between 2016 and 2017. This study, which can be classified as semi-experimental, employed a pretest-posttest design with an experimental and control group using the sexual satisfaction Larson questionnaire. The sole variation in this research pertained to the statistical population, and the findings demonstrated the efficacy of the treatment (28). A clinical trial conducted by Mirzaei Dostane et al. (2019) involved the evaluation of 30 HIV positive patients who were referred to the Abadan Behavioral Diseases Counseling Center. The study aimed to assess the effect of ACT on death anxiety levels, including prediction and fear of dying, and mental health among participants in eight sessions lasting 90 minutes each. The findings indicated that the implementation of ACT can effectively alleviate death anxiety and enhance the psychological well-being of individuals diagnosed with HIV. Thus, it can serve as a complementary therapy to improve the quality of life. Despite focusing on individuals with HIV-related anxiety, the findings indicate that ACT effectively increases cognitive adaptability and diminishes pessimistic thoughts and mental health (29).

Despite variations in the number of sessions, the type of questionnaire, and the studied population across different studies, it is evident that ACT, through its unique abilities and characteristics, has effectively assisted trained individuals in overcoming sensitivities. By practicing

concentration, accepting thoughts, and promoting psychological flexibility, ACT effectively reduces expectations and facilitates the emergence of new feelings, emotions, experiences, thoughts, and physical symptoms. This approach ultimately reduces conflicts with harmful reactions (30).

The results obtained in the present study were in agreement with the findings reported in most of the other studies except of study by Akbari Turkestani et al. (2017), who conducted a clinical trial that involved 60 couples referred to premarital counseling centers in Isfahan, Iran. The findings indicate that the ACT approach does not have a significant impact on couples' sexual desires in comparison to the traditional approach before marriage. The questionnaire utilized in the current study was different from the previous one, and the counseling approach employed was heterogeneous, taking the form of couples' therapy. Additionally, as per the researcher's findings, opting for a brief period before or right after marriage for counseling might not yield the desired results. This is because couples are usually filled with joy during this period and do not encounter issues that necessitate professional guidance. Furthermore, there were no instances of incurable diseases (31). This study demonstrated a notable strength in its careful selection of the target population, which consisted of both HIV-infected women and women with HIV-positive husbands. Individuals who endure severe social stigma for indulging in illicit sexual activities are forced to be isolated from society. The choice of this particular stratum as a statistical population is regarded as innovative in its own right, and implementing specific measures to address the issues within this stratum is seen as a new measure. One of the key strengths of this study was the decision to employ the ACT approach, given it is the most recent development in behavioral therapies. With regular training and exercises, this approach proved to be highly effective in increasing the psychological flexibility and motivation of the individual, empowering them to accept their situation and provide their spouse with the necessary support and safety, learning methods of increasing intimacy, mastering effective communication, building a satisfying sexual connection, expressing your emotions, needs, and desires, and experiencing heightened physical intimacy while emphasizing correcting behaviors and interactions.

The research was limited by the selection of women from Yazd and Meybod centers With the limitation of selecting more samples and a wider statistical population and the inability to include individuals with blindness. The limitations extend to the simultaneous evaluation of HIV-infected women, healthy women with HIV-positive husbands within the statistical population. Additionally, cultural barriers prevent the participation of men in the sessions, and the lack of mutual influence among the participants exacerbates these limitations. The research is further limited by the inclusion of training programs beyond the scope of the study, such as those offered via radio and television.

Conclusion

The results of this study can be used by counseling centers that focus on behavioral diseases. The administrators of these centers must train midwives and equip them with the necessary skills to offer sexual counseling services to this particular group. This can be achieved by emphasizing the comprehensive principles of acceptance and commitment therapy during their training. Such programs have the potential to enhance the quality of marital relationships, increase awareness, and rectify prevalent misunderstandings regarding sexual relationships. Ultimately, the improvement of sexual satisfaction can significantly contribute to improving individuals' overall quality of life.

Declarations

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Conflicts of interest

The authors declared no conflicts of interest.

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Ethical approval

The ethical considerations that were taken into account involved informing the participants about the research process and its timing, the nature of the intervention, obtaining written consent, maintaining the confidentiality of the sessions, and allowing the participants to withdraw from the study at any point during the research.

Code of Ethics

To conduct the research, the ethical code IR.SSU.REC.1397.110 was obtained from the Human Research Ethics Committee of Shahid Sadouqi University on 05/18/2018.

Authors' contribution

All authors NT, MD. and M.B. contributed to the study's manuscript writing. NT and MB cooperated in sampling section. NT and MD wrote the main manuscript. N.T. and M.B. wrote intervention sessions and tables 1, 2. NT and MD analyzed the data and interpreted the results. All authors NT, MD and MB read and approved the final manuscript.

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