



Association Levels Between Results from a Therapeutic Educational Program on Women Suffering from Genito-pelvic Pain Penetration Disorder and Their Socioeconomic Status

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Abstract

Introduction Sexual health is fundamental in an individual's well-being. Genito-pelvic pain/penetration disorder, also known as dyspareunia, is one of the most common sexual disorders, and approaches from physiotherapy include multimodal options, being education, a recent resource often used. Social and economic factors might influence the effectiveness of educational therapies in patients suffering this affliction. The objective of this study was to determine if there is an existing correlation between the participant's socioeconomic status and the results of a therapeutic educational program.

Methods A randomized controlled trial was performed using therapeutic education as intervention in a sample of 69 women suffering from genito-pelvic pain/penetration disorder. Results over time were assessed regarding pain intensity, pain-related outcomes, and sexual functioning. Socioeconomic status measurements were obtained in February 2022, and these included age, educational level, household monthly income, or job rank. A correlation analysis was performed between these outcomes using Pearson's correlation index and Spearman's rho statistic.

Results Results from the correlation analysis show that there is no significant correlation between any of the outcomes found in the results of the intervention and the socioeconomic status measurements.

Conclusion A therapeutic educational program improves pain intensity, pain-related outcomes, and sexual functioning in patients with persistent pelvic pain, independently from their age, educational level, household monthly income, or job rank.

Policy Implications Education is a powerful resource that improves sexuality outcomes despite the patient's socioeconomic status in patients suffering from genito-pelvic pain/penetration disorder.

Keywords Association · Dyspareunia · Education · Pelvic pain · Sexual dysfunctions · Socioeconomic status

Introduction

The World Health Organization (WHO) establishes that sexual health is fundamental for the overall well-being of a person. It sets a biopsychosocial model that enables the access to information about sexuality and the availability to receive a sexual health service and to create a surrounding that promotes sexual health (World Health Organization, 2022). WHO relates the social and economic context of a

person to its sexual health, and the potential influence that these factors might have in the development of sexual disorders (Castellanos-Torres et al., 2013).

Genito-pelvic pain penetration disorder (GPPPD), also known as dyspareunia or vulvodinia (with incidence rates of 6.6% in Spain) (Gómez et al., 2019), is one of the most common sexual disorders. It consists of a heterogeneous group of disorders that affect the person's capacity to experiment sexual pleasure or to respond sexually, producing a painful response instead (Thomas & Thurston, 2016). Dyspareunia and vulvodinia are often intermixed terms, with vulvodinia not necessarily involving the presence of pain during sexual intercourse. Also, dyspareunia can be classified in either primary or secondary, and based on its location in superficial or deep (Tayyeb & Gupta, 2021). Scientific literature classifies GPPPD in several ways, and its development is associated with a type of altered pain response, known

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as nociplastic pain. This type of pain develops in the absence of harmful stimuli and can associate primary or secondary hyperalgesia and allodynia (Siqueira-Campos et al., 2022). Many therapeutic options have been proposed to approach GPPPD from physiotherapy, such as electrotherapy, myofascial release, and exercise (Fuentes-Márquez et al., 2019; Klotz et al., 2018), and education has been outlined as a cost-effective resource that can potentially be very beneficial for these patients (Brünahl et al., 2018; Champaneria et al., 2012). Out of the available resources than can assess the social and economic factors that might influence the development and processing of GPPPD, one of the most robust determinants of mental and physical health and well-being is the socioeconomic status (SES) questionnaire. It is a self-administered questionnaire that assesses diverse measurements to establish social class or economic levels. Out of the many measurements that can be assessed, the American Psychological Association (APA) suggests education, income, and occupation as the most recommended measurements (American Psychological Association, 2022).

Due to the possible influence that social and economic factors could have over patients suffering from GPPPD treated with an educational approach, it is necessary to establish the levels of association between these outcomes. Therefore, the objective of this study is to assess if there is a correlation between the results obtained from a therapeutic educational program in patients suffering from GPPPD, and their socioeconomic status, assessed with their age, educational level, household monthly income, and job rank.

Methods

Design

This study was a parallel trial that addressed a correlation analysis where we assessed the level of association there is between socioeconomic-related outcomes and the results of a therapeutic educational intervention on women with persistent pelvic pain. The initial intervention was a randomized controlled trial, and results related to the change experienced by these women involving pain intensity, other pain-related outcomes, and sexual functioning. The study followed the ethical principles of the Helsinki declaration, and was approved by the Ethics Committees of University of Valencia (Valencia, Spain), Hospital de La Plana (Castellon, Spain), and Hospital de Sagunto (Valencia, Spain), and the protocol was registered in Clinical Trials (NCT05114473).

Interventions

The intervention consisted of a therapeutical education program composed of four weekly workshops that contained information

about pelvic floor anatomy, pain neuroscience, and sexuality. These workshops lasted around 40 min each and were developed and delivered by experienced physiotherapists in treating pelvic floor disorders and not only contained theoretical approaches but also allowed participants to be actively involved by a series of exercises and practical tasks. The content of this therapeutic education program can be accessed in the following link: <https://mariaplazacarrasco.com/dolor-relaciones-sexuales/>.

Participants were allocated into two different interventional groups or a control group. Participants in the intervention group received the educational program through (1) face-to-face (FG) workshops or (2) online (OG) access to a platform where videos of the educational program were uploaded. Participants in the (3) control group (CG) initially received no intervention but were given access to the educational program once the study concluded.

Participants

Participants were recruited through hospital databases and an online campaign delivered through the research team's social network accounts and the Chartered Society of Physiotherapists of the area. An infographic image was distributed along with a link to a Google Forms survey to register participants that could be possibly included. The research team then screened every registry to determine if the participant was eligible or not for inclusion.

The sample was composed of adult (< 18 years) women suffering from persistent pelvic pain for at least a period of 3 months and no reasonable medical explanation for the presence of pain. If women were diagnosed with a medical condition that logically explained the presence of pain, or if the initial episode of pain began in a period inferior to 3 months, participants were excluded.

Outcomes

Results from the randomized controlled trial involved several pain-related outcomes. Pain intensity was assessed using the Visual Analogue Scale (VAS). The VAS consists of a 10 cm horizontal scale that ranges from 0 to 10, being 0 no pain and 10 the maximum possible pain (Karcioglu et al., 2018). Pain-related outcomes were assessed using both the Pain Catastrophizing Scale (PCS), used to quantify an individual's pain experience, rating from 0 to 52, higher scores meaning worse outcome (Olmedillo-Zafra et al., 2013), and the Survey of Pain Attitudes-Brief (SOPA-B), that consists of 30 items scaled from 0=false to 4=true, with a minimum score of 0 and a maximum score of 120, higher scores meaning better outcomes (Tait & Chibnall, 1997), questionnaires. Finally, sexual functioning was assessed using the Female Sexual Function Index (FSFI),

an inventory designed to assess female sexual function that examines desire, arousal, lubrication, orgasm, satisfaction, and pain, rating from 2 to 36, higher scores meaning better function (Neijenhuijs et al., 2019).

Socioeconomical-related outcomes were assessed with the socioeconomical status (SES) questionnaire (Braveman et al., 2005; Fliesser et al., 2018). This is an adaptative resource that establishes a level or category according to simple questions involving income, occupation, educational level... and other outcomes of interest. In our study, SES was assessed through several questions that classified participants according to their educational level, household monthly income, and job rank, three of the most used outcomes in literature. Participant's age was also registered.

Participant's educational level was established according to the International Standard Classification of Education (ISCED) (UNESCO UIS, 2022) in 9 different levels (levels 0–8, being 0 pre-scholar educational level and 8 doctorate education level), household monthly income was established according to the Spanish National Institute of Statistics (INE) through an annual survey (INE.es, 2022) in 11 different levels (from 0 to more than 5.000€ per month), and job rank was established according to the Spanish Ministry of Labor through its latest collective occupational agreement (BOE.es, 2022) in 6 different levels (from level 1 being a job that requires no degree and level 6 being a job that requires a college-level degree).

Randomization and Blinding

Before allocation, participants were divided by blocks in either living on a different or close location to where the face-to-face program was implemented. Then, randomization was made using a sealed opaque envelope system with a 2:1 ratio in either OG or CG in participants not living close to the study location and either FG or CG in participants living close to the study location. Due to the nature of the intervention, blinding was only possible in the researchers carrying the assessments and the researcher in charge of statistical analysis. Participants and researchers in charge of delivering the programs could not be blinded.

Statistical Analysis

Calculations were performed with the SPSS Statistics software, v.23 for MacOS. Sample size was calculated using the G-Power software, establishing that for an estimate 80% power and an alpha-error of 0.05, overall sample should consist of at least 48 participants; 16 of them contained in each of the established groups. Due to possible dropouts, it was established that the

sample must contain at least 60 participants. Normal distribution of data was checked through the Kolmogorov–Smirnov test.

Results over time from the educational program were calculated using ANOVA tests of repeated measures, calculating mean differences and standard deviations for every outcome in every group. These results were used in the association with the SES outcomes through a correlation analysis. SES outcomes and participant's age were associated using Pearson's correlation index, and due to the outcome nature of the rest of the SES outcomes, association of results with educational level, monthly income, and job rank was established through a non-parametric test, Spearman's rho.

Results

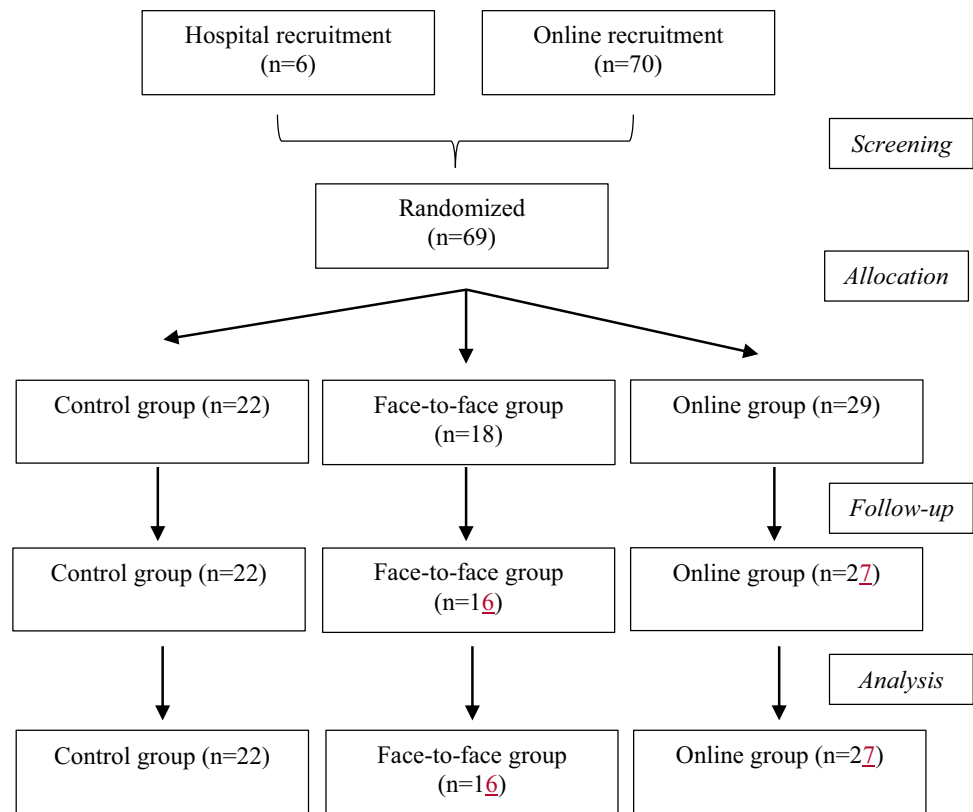
Participant flow chart is shown in Fig. 1. Out of the initially recruited participants, inclusion and exclusion criteria were passed through, and a total of 69 participants were finally included. Participants were then randomized to an intervention or a control group. Once the intervention ended, 4 participants were lost to follow-up, all of them due to voluntarily refuse to take post-intervention assessments.

Participant's baseline characteristics and socioeconomic status level frequencies are summarized in Table 1. Participant's mean age was similar in every group. Regarding educational level, all participants had at least a level 4, and most of them ($n=33$, 48%) had a level 5. With respect to monthly household income, the vast majority, $n=60$ (87%), of participants were grouped in the middle-levels of income. Finally, involving job rank, participants were more frequently allocated to jobs that required no degree at all ($n=27$, 39%) or that required a college degree ($n=19$, 28%).

Results from the ANOVA are summarized in Table 2. Significant improvements ($p<0.05$) were found both in the face-to-face group and the online group regarding pain intensity, assessed with the VAS, and in pain catastrophizing in the online group, assessed with the PCS. Non-significant improvements were also found in pain catastrophizing in the face-to-face group, pain attitudes for both groups, assessed with the SOPA-B, and sexual functioning, assessed with the FSFI.

Results from the correlation analysis with every outcome assessed with the SES are presented in Tables 3, 4, 5 and 6. Regarding age, there is no significant ($p<0.05$) interaction between the results obtained and the age of the participants, meaning that participants improved in every outcome independently from their age. Educational level, household monthly income, and job rank showed no interaction too, meaning these outcomes had no relevant influence in the improvement participants experimented.

Fig. 1 Participant flow chart



Discussion

This study assessed the correlation levels of the results of a therapeutic educational program in patients suffering from GPPPD and their socioeconomic status. Analyzing the association between these outcomes, no significant correlation levels were observed, meaning that the improvement these patients experimented regarding pain-related and sexual functioning outcomes was independent from their age, educational level, household monthly income, or job rank.

People with a lower socioeconomic status have poorer health outcomes in many diseases, especially diseases with pain-processing dysfunctions such as fibromyalgia (Fitzcharles et al., 2014) or musculoskeletal pain (Macfarlane et al., 2009; Bergman et al., 2001), due to financial issues, access to health interventions, or low adherence rates to medical recommendations. Our study had a relatively young sample (32.8 years) composed of women suffering GPPD. Other studies (Fitzcharles et al., 2014) that did find significant correlation levels did so with older samples or samples composed by women and men, suggesting both age and gender could be relevant.

Every outcome assessed in this study is subjective and depends on the patient's perception of their pain and sexual functioning, so results may not truly reflect the health status of participants. Also, only significant improvements were found in both groups for pain intensity, assessed with VAS, and only in one of the groups for pain catastrophizing, assessed with PCS, the rest of the improvements were non-significant. Possibly, with better results, there could be a significant influence of socioeconomic factors. Adherence rates to the programs could also be relevant. Participants in the online group could access the program anywhere and at any time during the week; therefore, this could have enabled higher adherence rates in this group, explaining the better results.

Authors also chose to use both Pearson's correlation index and Spearman's rho statistic to do the correlation analysis. Other studies used between-group comparisons with a *t*-test (Armour et al., 2020), multiple hierarchical regression analyses (Fliesser et al., 2018), or Poisson regression analysis (Landry & Bergeron, 2009). Since there is no gold standard statistical assessment, in this case, authors decided to replicate statistical analyses performed in similar studies to establish correlation levels, using Pearson's correlation index

Table 1 Participant's baseline characteristics and socioeconomic status category frequencies

	Total	Face-to-face	Online	Control
Age (years) (SD)	32.8 (9.5)	34.5 (13.2)	31.6 (6.9)	33.0 (9.1)
Educational level				
Level 0	0	0	0	0
Level 1	0	0	0	0
Level 2	0	0	0	0
Level 3	0	0	0	0
Level 4	5	0	2	3
Level 5	7	2	4	1
Level 6	33	11	13	9
Level 7	22	4	10	8
Level 8	2	1	0	1
Income level				
0–499€	1	1	0	0
500–999€	1	1	0	0
1.000–1.499€	16	7	3	6
1.500–1.999€	15	3	8	4
2.000–2.499€	10	2	7	1
2.500–2.999€	9	1	3	5
3.000–3.499€	10	2	5	3
3.500–3.999€	1	1	0	0
4.000–4.499€	2	0	1	1
4.500–4.999€	0	0	0	0
> 5.000€	4	0	2	2
Job rank				
Level 1	27	9	8	10
Level 2	1	0	1	0
Level 3	6	3	0	3
Level 4	6	1	4	1
Level 5	19	4	9	6
Level 6	10	1	7	2

to correlate continuous variables (results and age) (Landry & Bergeron, 2009) and Spearman's statistic to establish correlation between continuous (results) and categorical (educational level, household income and job rank) variables (Armour et al., 2020).

Our study has limitations. First, out of the multiple options that could be chosen to assess SES, we only chose three major measurements. Household income and job rank are factors that do not influence health outcomes equally during the whole life

Table 2 Results of the ANOVA

Outcome	Group	Mean (SD)	
		POST	PRE
VAS (points) <i>Mean (SD)</i>	Face-to-face	5.3 (2.5)	3.8 (2.4)
	Online	5.8 (2.0)	4.9 (2.5)
	Control	5.1 (1.8)	4.9 (2.2)
PCS (points) <i>Mean (SD)</i>	Face-to-face	25.2 (12.7)	18.9 (12.6)
	Online	28.0 (10.4)	20.4 (11.5)
	Control	22.4 (7.5)	25.3 (8.2)
SOPA-B (points) <i>Mean (SD)</i>	Face-to-face	45.1 (10.6)	45.2 (14.5)
	Online	49.6 (13.1)	50.9 (14.8)
	Control	52.4 (13.0)	52.4 (13.6)
FSFI (points) <i>Mean (SD)</i>	Face-to-face	18.9 (7.8)	21.0 (9.5)
	Online	19.1 (7.3)	20.8 (8.1)
	Control	19.5 (7.1)	18.4 (9.3)

of a patient, so these must be understood within the sample we are analyzing, which is relatively young. However, the level of education has been validated as a reliable, accurate, and consistent measurement of SES (Liberatos et al., 1988; Shavers et al., 2007), chosen as the best predictor of good health (Wnkley et al., 1992; Braveman et al., 2005), and it is to be understood as a factor that does not generally change overtime.

Also, for every measurement, we established levels according to specific guidelines that adhere to the author's country, and these levels might change according to the educational program, economy, and job classification of different countries. Despite this, authors tried to choose classification systems with many categories in every measurement, assuring as many social gradients applied to the social spectrum as possible (Braveman et al., 2005).

Social Policy Implications

The aim of this study was to assess if the socioeconomic status of a patient influenced the results of a therapeutic educational program when treating Genito-Pelvic Pain/ Penetration Disorder. Results show that despite their socioeconomic status, patients improved in several outcomes involving their sexual health, meaning that education is a powerful cost-effective weapon that can be used in every patient suffering from this affliction (Armour et al., 2020; Landry & Bergeron, 2009).

Table 3 Results from the correlation analysis regarding age

Outcome	Face-to-face		Online		Control	
	Pearson's correlation index	<i>p</i> -value	Pearson's correlation index	<i>p</i> -value	Pearson's correlation index	<i>p</i> -value
VAS	0.384	0.071	-0.157	0.217	0.190	0.199
PCS	0.384	0.071	-0.157	0.217	0.190	0.199
SOPA-B	-0.366	0.081	0.287	0.073	0.543	0.005
FSFI	-0.212	0.216	-0.313	0.056	0.137	0.271

Table 4 Results from the correlation analysis regarding educational level

Outcome	Face-to-face		Online		Control	
	Spearman's rho	<i>p</i> -value	Spearman's rho	<i>p</i> -value	Spearman's rho	<i>p</i> -value
VAS	-0.044	0.871	-0.082	0.685	-0.102	0.651
PCS	-0.044	0.871	-0.082	0.685	-0.102	0.651
SOPA-B	-0.109	0.688	-0.228	0.252	-0.065	0.773
FSFI	0.061	0.823	-0.098	0.625	0.200	0.372

Table 5 Results from the correlation analysis regarding household monthly income

Outcome	Face-to-face		Online		Control	
	Spearman's rho	<i>p</i> -value	Spearman's rho	<i>p</i> -value	Spearman's rho	<i>p</i> -value
VAS	-0.145	0.593	-0.035	0.863	0.020	0.928
PCS	-0.145	0.593	-0.035	0.863	0.020	0.928
SOPA-B	-0.080	0.768	0.222	0.265	-0.123	0.586
FSFI	0.127	0.638	0.000	0.999	0.118	0.600

Table 6 Results from the correlation analysis regarding job rank

Outcome	Face-to-face		Online		Control	
	Spearman's rho	<i>p</i> -value	Spearman's rho	<i>p</i> -value	Spearman's rho	<i>p</i> -value
VAS	0.117	0.666	0.089	0.658	-0.063	0.780
PCS	0.117	0.666	0.089	0.658	-0.063	0.780
SOPA-B	-0.153	0.572	-0.132	0.512	0.015	0.948
FSFI	-0.383	0.143	0.008	0.970	-0.050	0.825

Conclusion

Results from this research suggest that a therapeutic educational program improves pain intensity, pain-related outcomes, and sexual functioning in patients with persistent pelvic pain, independently from their age, educational level, household monthly income, or job rank.

Author Contribution All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by Aida Lopez-Brull, Lola Canton-Vitoria and Maria Plaza-Carrasco. The first draft of the manuscript was written by Borja

Perez-Dominguez, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data Availability The data that support this study cannot be publicly shared due to ethical or privacy reasons and may be shared upon reasonable request to the corresponding author if appropriate.

Code Availability Not applicable.

Declarations

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Univer-

sity of Valencia; Hospital de Sagunto and Hospital La Plana Ethics Committee(s) approved this study.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent for Publication The authors affirm that human research participants provided informed consent for publication of the images in Fig. 1.

Conflict of Interest The authors declare no competing interests.

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