Pregnancy-Related Pelvic Girdle Pain in Polish and Norwegian Women

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Abstract

Objectives: The aim of the study was to assess prevalence of pelvic girdle pain (PGP) in Polish and Norwegian pregnant women.

Methods: We enrolled 189 Polish and 75 Norwegian randomly selected pregnant women. The participants were 12 to 36 weeks pregnant. They filled in a self-administered questionnaire concerning their demographic data, pregnancy parameters, and the character and location of pain. To differentiate between various kinds of pain, pain maps were used. The participants could mark lumbar pain, PGP, or combined pain (PGP + lumbar pain). Based on pain locations, different subgroups of PGP were recognized. To assess the intensity and functional limitations related to PGP, the pain scale and the Pelvic Girdle Questionnaire were used.

Results: The prevalence of isolated PGP did not differ statistically between the groups, being declared by 17% of Polish women and 19% of Norwegian women ($P = .074$). Overall prevalence of PGP (together with combined pain) was reported more often by Norwegian women (56%) than Polish women (42%) ($P = .043$). The pain in all 3 pelvic joints was statistically more common in Norwegian women as well ($P = .037$). There were no other statistical differences in PGP subgroups between the participants. Mean values of the numeric pain scale were 4.87 for Poles and 4.88 for Norwegians, and of the Pelvic Girdle Questionnaire 32.67% and 41.76% for Poles and Norwegians, respectively. These differences were not statistically significant.

Conclusions: Isolated PGP has been reported by a similar percentage of Polish and Norwegian women. The severity of signs and symptoms of PGP is similar in both study groups. (J Manipulative Physiol Ther 2019;42:117-124)

Key Indexing Terms: *Pelvic Girdle Pain; Pregnancy; Prevalence*

Introduction

Pelvic girdle pain (PGP) and low back pain (LBP) may be present in pregnant women. Pelvic girdle pain may appear isolated or together with LBP in the form of combined pain (PGP + LBP).[1] The pain is felt between the posterior part of iliac crest and lower parts of gluteal folds, mainly in the area of sacroiliac joints (SIJs). It may radiate to the posterior part of the thigh. Pubic symphysis pain may accompany it or appear isolated. Other regions often reported painful are the groin and the coccyx area. Pelvic girdle pain results in difficulties with standing, sitting, and walking. Its diagnosis should be confirmed with dedicated provocation tests.[2] In this report, LBP is understood as a pain in lumbar area, above the lumbosacral junction, sometimes referred to as lumbar pain.[3,4] We decided to use the term *LBP* in accordance with a previous studies on PGP.[1,5-9]

Until recently, many authors defined LBP and PGP simultaneously as a single condition.[9] However, it has become important to distinguish between the 2 because of different clinical presentations and management.[4,10,11] Pelvic girdle pain seem to be related to more pain and functional disturbances than LBP.[3,5,12] Patients with PGP have decreased muscular endurance, whereas in patients with LBP muscular endurance does not decrease.[4]

Pelvic girdle pain appears isolated in approximately 20% of women.[1,2] However, various authors apply different diagnostic criteria, and therefore they quote different numbers. In most pregnant women experiencing PGP, the

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Table 1. *Characteristics of Participants*

	Mean		SD		Minimum		Maximum		Median		
Characteristic	PL	NO	PL	NO	PL	NO	PL	NO	PL	NO	*P*
Age (y)	29.85	32.23	3.84	3.55	21	24	40	40	30	32	<.001
Height (m)	1.67	1.69	0.06	0.05	1.52	1.58	1.80	1.81	1.68	1.69	.039
BMI before pregnancy (kg/m^2)	21.66	22.64	3.00	2.74	15.67	17.99	36.57	29.64	21.30	22.15	.019
Gestation week	26.89	26.60	5.67	6.38	12	12	36	36	28	27	.992

BMI, body mass index; *NO*, Norwegian; *PL*, Polish; *SD*, standard deviation.

pain subsides spontaneously shortly after delivery. Still, 7% report considerable prolonged PGP in several ongoing years.[1] Pelvic Girdle Syndrome (PGS) (pain in all 3 joints) has the worst prognoses—21% of women report pain 2 years after delivery.[11] Pelvic girdle pain, particularly in its chronic form, has considerable socioeconomic consequences.[10,13] In Norway, it is one of the most common reasons for sick leave during pregnancy.[13,14] Most PGP studies come from Scandinavian countries, where it is being reported with higher rates.[9,15,16] Therefore, there is a common belief that PGP is more prevalent and severe in Scandinavia. A recent multinational study found that PGP is a common musculoskeletal problem in the United States, the United Kingdom, Norway, and Sweden, showing the highest pain rates of PGP or LBP in the United Kingdom.[17] Differences in reporting PGP prevalence often are attributed to the level of awareness about the condition among public and heath care providers. Although the issue of various health complaints related to pregnancy has been discussed by Polish authors, PGP has not been studied in detail in Polish literature so far and the term itself was not in use before.

The aim of the study was to analyze PGP prevalence and severity in pregnant Poles. It was decided to compare the obtained results with those from Norway, where the society is highly aware of the PGP issue.

Methods

A total of 323 pregnant women participated in the study: 234 Poles and 89 Norwegians. Criteria for participant inclusion in the study were as follows: a single, uncomplicated pregnancy; informed consent to participate in the study; age between 18 and 40 years; and gestation week between 12 and 36. Criteria for participant exclusion from the study were additional diseases or disorders that may induce lumbar pain or PGP (among others, scoliosis, disc disorder, hip dysplasia, constitutional hypermobility, Scheuermann disease, and multiple pregnancy).

Having applied all the exclusion criteria, we were left with 189 Polish and 75 Norwegian responses. There was no difference regarding mean gestation week; however, there were statistically significant differences between pregnant Poles and Norwegians for age, body height, and body mass index. Table 1 presents characteristics of both studied groups.

The participants were given a self-administered questionnaire to provide the information on basic anthropometric and demographic data (height, body mass), the character of occupation (mental work or physical work), the course of pregnancy (gestation week, singleton or twin, parity), physical activity in the year before pregnancy (physical activity during the free time, longer than 30 minutes: never, once a week, twice a week, 3 or more times per week), current and past disorders from the lumbar spine or the pelvic girdle (to fill in if any for comparison with exclusion criteria), any chronic diseases or disorders (to fill in if any for comparison with exclusion criteria), and urinary incontinence (never, sometimes, often, always).

In addition, we used the following study instruments: numeric pain scale (0-10) to assess the PGP pain intensity and body diagrams with possibly painful areas marked (Fig 1) to choose the adequate and body diagram (pain map) for marking the actual pain (to verify the reliability of previous declarations and to ascertain the PGP subgroups) (Fig 2). To assess PGP-related functional deficits, we used a condition-specific measure, the Pelvic Girdle Questionnaire (PGQ).[18]

For the part of the study held in Norway, we designed the relevant self-administered questionnaire in Norwegian. First, we translated our own questionnaire into English. Then, a Norwegian native speaker proficient in English translated the English version into Norwegian. The self-administered questionnaire was designed to provide the basic data; therefore, we have not seen the need to validate it. Those items that required operational definitions (never, sometimes, etc) were not included in the final analysis and results presentation. The basic data questionnaire has not been a sociological tool, and the aforementioned questions concerned simple demographical and medical data. In this part, we did not use ordinal scales, self-assessments, or estimations. We did not observe any single problem with answering the questions by our participants. Therefore, we provided no pilot study with basic data questionnaire.

The PGQ was used in the original, Norwegian version. For the Polish part of the study, we used the PGQ in our

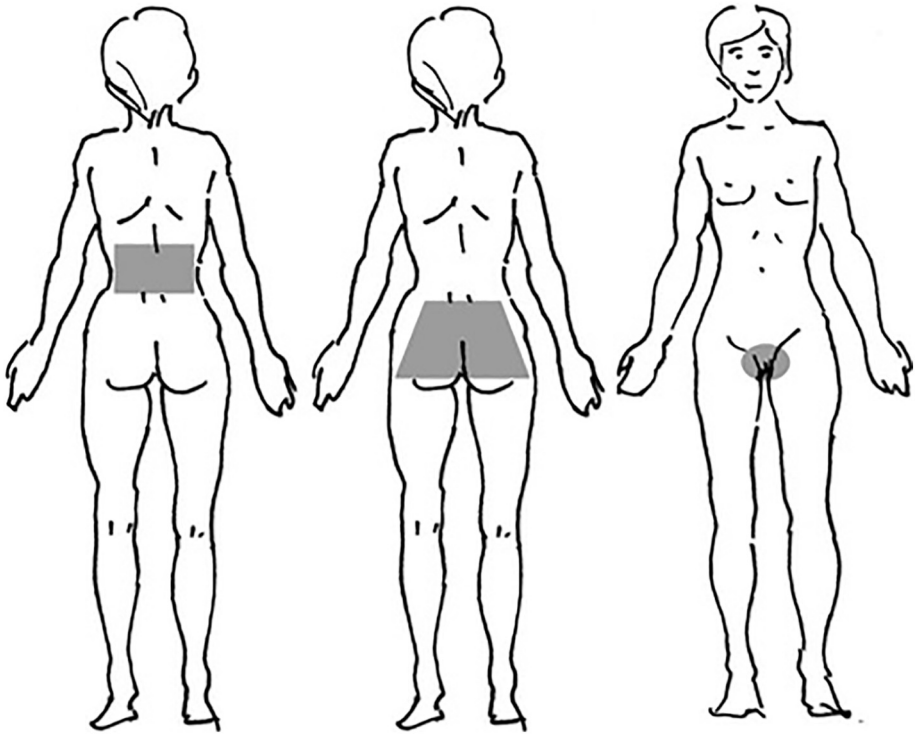

Fig 1. *Used body schemes with lumbopelvic pain locations.*

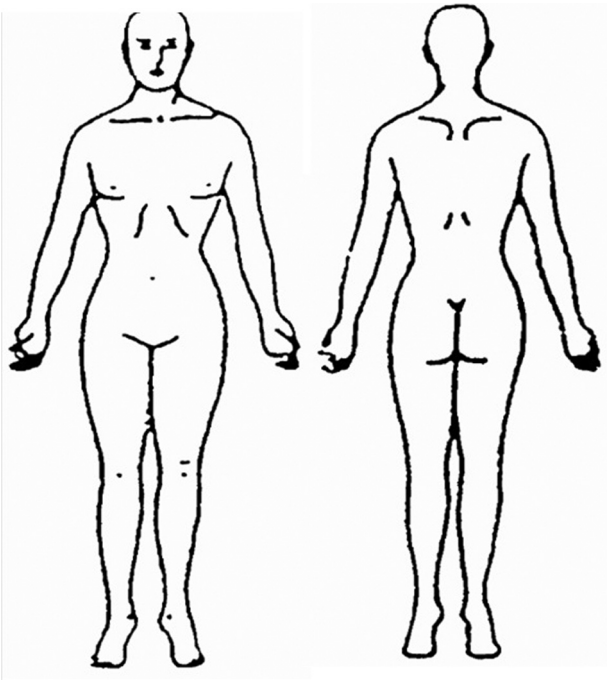

Fig 2. *Used body diagrams: pain maps.*

own translation. It was translated from English into Polish language by the physiotherapist proficient in English and specialized in women's health and PGP.

In Poland, the self-administered questionnaires were completed in birth schools, in gym classes for pregnant women, and in gynecological outpatient clinics. In Norway, the study was conducted in state health care centers (Oslo Kommune Helsestasjonen), in yoga classes for pregnant women, and in private midwives' offices. The recruited women lived in Oslo and its neighboring areas. Those who were willing to participate in the study filled in the aforementioned papers.

Ethics

The Ethics Committee of Jozef Pilsudski University of Physical Education approved the study protocol. The ethics reference number for the study is SKE 01-26/2015.

Statistical Analysis

All variables have been measured individually, and statistics were computed from independent, individual data using SPSS version 24 software (IBM Corp, Armonk, New York). To process the data collected, we used the Mann-Whitney U-test, χ^2 test, and Fisher exact test. We set statistical significance at $P < .05$. Because the interval character of our most important variable (PGQ score) has not been proven, we decided to use the nonparametric method in a whole study to obtain a unified, clear analysis. Therefore, the numeric pain scale, PGQ, onset of pain (gestational week), actual gestational week, age, height, and

Table 2. *PGP Prevalence*

	PL (n = 189)		NO (n = 75)		
Type of Pain	n	%	N	%	*P*
PGP isolated	32	17	14	19	.074
Combined pain (PGP + LP)	47	25	28	37	.043
PGP overall (isolated PGP + combined pain)	79	42	42	56	.037

LP, lumbar pain; *NO*, Norwegian; *PGP*, pelvic girdle pain; *PL*, Polish.

initial body mass index have been treated as ordinal variables and analyzed with the Mann-Whitney test. Categorical data, like PGP, combined pain, pain locations unilateral or bilateral PGP, and symphysis pubis were analyzed with the χ^2 test or Fisher exact test. The analysis was based on frequencies obtained from independent individual questionnaires. If data met the minimum expected frequency assumption (no cells with expected frequency <5), we used χ^2, otherwise the *P* level was directly computed using Fisher exact method.

Results

The prevalence of isolated PGP did not differ statistically between the groups. It was declared by 17% of Polish women and 19% of Norwegian women ($P = .074$). When considered also in a mixed form (together with LBP), PGP was statistically more prevalent in pregnant Norwegians (56%) than in pregnant Poles (42%) ($P = .037$). Table 2 presents the prevalence of the condition in both groups related to relevant criteria.

Analyzing the PGP localizations, pubic symphysis pain was statistically more prevalent in Norwegian (35%) than in Polish participants (15%, $P < .001$). Differences in pain felt in the posterior part of the pelvic girdle were not statistically significant. Table 3 presents the distribution of pain locations in both groups.

We decided to determine the PGP subgroups in our participants. The body diagrams (pain maps) presented possible pain syndromes that were then categorized into 4 types: (1) bilateral PGP (marked on the posterior part, in vicinity of both SIJs), (2) unilateral PGP (marked on the posterior part, on the area of a single SIJ), (3) pain related to the pubic symphysis, and (4) PGS (marked on all 3 joints in the pelvic girdle). The fifth type of pain, different from the general types, was simultaneous pain in the vicinity 1 SIJ and pubic symphysis. The Norwegians experienced PGS statistically more often than the Poles (<.001). Table 4 presents distribution of individual PGP subgroups in both groups.

Pain intensity in the Polish group was estimated on mean 4.87 ± 1.73, and in the Norwegian group on 4.88 ± 2.41. We did not find statistically significant differences in pain intensity or the pain onset (gestation week). Although observed functional disturbances (PGQ) seemed worse in Norwegian women, the difference was not statistically significant either. Table 5 presents distribution of these parameters in both studied groups.

We decided to investigate what proportion of the declared pain may result in relevant limitations to everyday activity and quality of life. Values higher than 5 on the 0 to 10 numeric pain scale and higher than 30% on the PGQ pointed to such limitations. More than a half of the participants with PGP in both groups declared PGQ values higher than 30%. We found no statistically relevant differences between both groups. Table 6 presents the distribution of intensified PGP syndromes.

Discussion

In the present study, we have compared participants from Norway, where PGP is a well- known term and clinically recognized condition, with participants from Poland, were the PGP term was not in use before. Although overall prevalence of PGP was higher among Norwegian participants, it was also commonly reported by Polish women, causing a similar impact on pain intensity and function.

There seem to be some discrepancies in the literature regarding the prevalence of PGP. Table 7 presents the distribution of PGP as described in the literature. We marked with an asterisk those studies that used a similar method to ours—where the diagnosis was based on participants' reports and pain drawings.

Our results seem to be consistent with European Guidelines and large literature reviews.[1,2,15] According to these, the PGP prevalence is about 20% (16%-25%). However, one should consider that the prevalence rate was based on studies of isolated PGP. Some authors interpret PGP as an isolated condition, whereas others also include PGP accompanied by LBP (combined pain). The European Guidelines state that the conclusion on PGP prevalence was based on patients with PGP only.[2] In comparing different reports, it must be remembered that this condition

Table 3. *PGP Pain Locations*

	PL (n = 79)		NO (n = 42)		
PGP Pain Location	n	%	N	%	*P*
Unilateral PGP (vicinity of 1 SIJ)	9	5	7	9	.365
Bilateral PGP (vicinity of 2 SIJ)	51	27	28	37	.116
Symphysis pubis	29	15	26	35	<.001

LP, lumbar pain; *NO*, Norwegian; *PGP*, pelvic girdle pain; *PL*, Polish; *SIJ*, sacroiliac joints.

Table 4. *PGP Subgroups*

	PL			NO			
PGP Subgroups	N	% PGP	% All	N	% PGP	% All	*P*
Bilateral PGP	43	54	23	12	29	16	.223
Unilateral PGP	7	9	4	4	9	5	.550
Symphysis pubis (only)	19	24	10	7	17	9	.859
Pelvic Girdle Syndrome (bilateral PGP + symphysis pubis)	8	10	4	16	38	21	<.001
Unilateral PGP + symphysis pubis	2	3	1	3	7	4	.114

NO, Norwegian; *PGP*, pelvic girdle pain; *PL*, Polish.

Table 5. *Pelvic Girdle Pain Characteristics*

	Mean		SD		Minimum		Maximum		Median		
Pain Characteristic	PL	NO	PL	NO	PL	NO	PL	NO	PL	NO	*P*
Numeric Pain Scale (0 to 10)	4.87	4.88	1.73	2.41	1	1	9	10	5	5	.99
Onset of pain (gestational week)	20.67	20.62	8.10	5.83	0	8	34	34	20	20	.59
PGQ (%)	32.67	41.76	17	22.29	0	6	71	88	31	40	.128

NO, Norwegian; *PGQ*, Pelvic Girdle Questionnaire; *PL*, Polish; *SD*, standard deviation.

may occur in the combined form as well (accompanied by LBP).

Reports about prevalence of different subgroups of PGP also seem to vary. Table 8 presents a comparison of the selected studies with our results. An attempt at comparing results collected by several authors often requires conducting additional calculations related to the differences in distinguishing between the types of the condition and how they were presented in percentages. Some of the authors present total estimates of PGP, whereas some divide the pain into PGP types or present its mixed conditions. Some authors present the PGP percentages in relation to the whole study population, whereas others present in relation only to the part of the population that experiences lumbopelvic pain or solely PGP. These differences in result presentation make the prevalence analysis more difficult. Tables 7 and 8 show recalculated results of other authors. They are presented as a percentage of the total number of participants studied.

The differences in results among the presented reports may be related to the way the pain was categorized, the age and gestation week of the participants, and the type of the study (prospective or retrospective). It may seem surprising that in some of the studies, women whose pregnancy was more advanced than 36 weeks were not excluded. At that time of pregnancy, the uterus with the fetus descends into the lower pelvis, below the pubic symphysis.[19] If pain appears then, it may result from the pressure of the baby's head onto the structures within the pelvis.[20] Therefore, the mechanism of the then-common pelvic pain is different from the PGP mechanism. In our opinion, it should not be categorized as

Table 6. *PGP Severity*

	N		% With PGP		
Intensified PGP Characteristic	PL	NO	PL	NO	*P*
Numeric pain scale PGP >5	28	17	35	40	.773
PGQ >30%	41	29	52	69	.069

NO, Norwegian; *PGP*, pelvic girdle pain; *PGQ*, Pelvic Girdle Questionnaire; *PL*, Polish.

Table 7. *PGP Prevalence in Other Reports*

Country	N	Gestational Week (Mean)	PGP (%)	Combined Pain (PGP + LBP) (%)	PGP Overall (PGP and PGP + LBP) (%)
Norway (Robinson 2010) [a]	283	30	52	25	77
Norway (Robinson 2006) [a]	1817	Retrospective	–	–	46
Norway (Bjelland 2010) [a]	75939	30	–	–	58
Norway (Malmqvist 2012) [a]	569	Retrospective	–	–	61
Australia (Pierce 2012) [a]	96	28-41 (34.8)	22	33	55
Spain (Kovacs 2012) [a]	1158	31-38 (35)	–	–	64.7
Iran (Mousavi 2007)	325	12-36 (30.2)	28	8.3	36.3
India (Gupta 2014)	227	12-36 (24.2)	29.5 (PPP [b])	–	–
Sweden (Gutke 2006)	313	12-18 (15)	33	18	51
Netherlands (Mens et al 2012)	182	20-30	–	–	49

LBP, low back pain; *PGP*, pelvic girdle pain; *PPP*, posterior pelvic pain only.
[a] Used methods similar to present report (self-reported pain locations, pain drawings).
[b] Symphyseal pain not included in analysis.

pure PGP. Among presented studies (Table 7), only Gupta et al[21] and Mousavi et al[22] limited their study population to women whose pregnancies were between 12 and 36 weeks. We believe such scope of gestational weeks allows for a reliable assessment of PGP prevalence.

Pelvic girdle pain often had been mentioned as an issue related especially to Scandinavia.[15,16] Although many studies on PGP originated in Scandinavian countries, the studies we quoted show that the issue is widely prevalent. According to Kanaris et al,[15] higher prevalence of PGP in Scandinavia and the Netherlands should be interpreted in the context of more aware health service and society. Pelvic girdle pain is one of the most common reasons behind pregnant women taking sick leave in Norway.[13] It may be related to the higher prevalence of PGS there—this has been clearly shown both in our study and in the studies we quoted. Pelvic girdle pain is believed to be the worst type of PGP because it results in the most serious deficits in everyday functioning of affected patients.[5,6,11]

The musculoskeletal complaints of pregnancy commonly have been perceived as a normal discomfort of pregnancy. In most cases, no need was seen and no effort was undertaken to employ specific medical treatment. As a result, pregnant women experiencing PGP are rarely referred for detailed diagnosis.[8,10,23] Still, there are accounts in the literature that PGP may be related to considerable pain and a high degree of disability.[3,6] In the presented study, more than half of the women with PGP from both groups indicated PGQ values higher than 30%. Such results can be interpreted as noticeable functional limitations. In the study by Malmqvist et al,[12] 26% of women declared medium or severe PGP (Numeric Rating Scale value of 35 or higher). Among them, 40% still complained of pain 5 months after delivery. According to Rost et al,[24] 10% of women who experienced PGP during pregnancy still suffer from medium or severe pain 18 months postpartum. Engeset et al[25] confirm these results and conclude that PGP may affect quality of life not only months, but even years after delivery. Pierce at al[8] outlined

Table 8. *Prevalence of PGP Subgroups in Other Reports and Comparison With Present Results*

Country	Symphysis Pubis (Only) (%)	PGP Unilateral (%)	PGP Bilateral (%)	PGS (%)	PGP Unilateral + Symphysis Pubis (%)
Netherlands (Mens 2012)	3	15	21	8	2
Norway (Robinson 2010)	7	45	–	17	8
Norway (Robinson 2006)	19	14	–	5	4
Norway (Bjelland 2010)	13	10	14	15	–
Norway (Malmqvist 2012)	12	15	10	20	–
Present report					
Polish women	10	4	23	4	1
Norwegian women	9	5	16	21	4

PGP, pelvic girdle pain; *PGS*, Pelvic Girdle Syndrome.

that only 25% of pregnant women who reported PGP received some sort of treatment. The complexity of chronic pain syndromes like PGP impose actions concentrated on early recognition and effective management.

Limitations

We based the PGP diagnosis on participants' reports and pain maps, with no clinical examination. However, this way of classifying PGP is quite common in the literature,[5,6,8,12,26] and previous studies showed that self-reported PGP correlated well with clinically examined PGP.[27-29] Another limitation was that we used the not culturally adapted and validated PGQ version. We believe that using an international questionnaire, even if it not standardized, has a higher value than creating a questionnaire on our own. Cross-cultural adaptation of PGQ for the Polish population was in progress at that time and has recently been published.[30]

The Value of the Study

According to our best knowledge, this was the first pregnancy-related lumbopelvic pain study in Poland that analyzed and classified PGP subtypes according to European Guidelines and recent tendencies in international literature. There are attempts to unify the terminology, categories, and treatment applied in the world of medicine. Introduction of internationally recognized terms for pregnancy-related health issues will facilitate exchange of information among health professionals and provide better health care for patients. Even with its limitations, this study may provide a starting point for further research of PGP in Polish women.

Conclusion

This is the first known Polish study that analyzed in detail the prevalence of PGP subtypes in pregnant Poles and compared its severity with the findings from the country where PGP is a well-known and researched condition. Isolated PGP has been reported by a similar percentage of Polish and Norwegian women. The severity of signs and symptoms of PGP did not differ between the groups.

Funding Sources and Conflicts of Interest

No funding sources or conflicts of interest were reported for this study.

Contributorship Information

Concept development (provided idea for the research): M.S., A.T.-B.
Design (planned the methods to generate the results): M.S.
Supervision (provided oversight, responsible for organization and implementation, writing of the manuscript): A.T.-B.
Data collection/processing (responsible for experiments, patient management, organization, or reporting data): M.S.
Analysis/interpretation (responsible for statistical analysis, evaluation, and presentation of the results): M.S., A.T.
Literature search (performed the literature search): M.S.
Writing (responsible for writing a substantive part of the manuscript): M.S.

Critical review (revised manuscript for intellectual content, this does not relate to spelling and grammar checking): A.T.-B., W.R.

Practical Applications

- This is the first study that investigates PGP among Polish women and proves its high prevalence and effect on everyday activities.
- In Norway, PGP is a well-researched condition that is recognized by health care professionals.
- Obtained findings underline the need for identifying PGP as a widely prevalent disorder, not restricted to the Scandinavian population as sometimes stated.

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