



# Assessment of the pregnancy education programme with 'EDUMA2' questionnaire in Madrid (Spain)

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## Keywords

assessment programmes, centring pregnancy/group care, childbirth education, parenting education, prenatal care/methods, primary care

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## Abstract

**Rationale, aims and objectives** The prenatal education promotes the empowerment of parents during pregnancy and postnatal period. This study aimed to assess the quality of educational sessions held in the third trimester of pregnancy as part of the parenting education programme for Spanish National Health System in Madrid.

**Methods** The design is a cross-sectional study in 41 primary care centres in the autonomous community of Madrid, which is one of the 17 autonomous communities that constitute the Spanish State, each with medical responsibilities. The participants are a representative probability sample of 928 attendees to the programme. The assessment instrument is 'EDUMA2' questionnaire (Cronbach's  $\alpha = 0.829$ ) of 56 variables. Descriptive statistical analysis was performed using SPSS. The project was approved by the Research and Ethics Committees of the University Hospital of La Paz.

**Results** The uptake efficiency immigration risk is 14.7%, and lack of social support is 8.7%. The functionality in organization, teaching and methodology is high in 90.5%. The learning effectiveness of health habits, care and techniques is significant and greater than 60% in the 14 parameters studied. Satisfaction is very high at 67.5%. The immediate impact in terms of control or safety increase is significant and greater than 71% and significantly greater than 40% and for increasing the bonding with the baby.

**Conclusions** No jobs found with which to compare. The assessment of the programme with adequate psychometric characteristics questionnaire allows designing strategies and research to improve the quality of prenatal education.

## Introduction

Education and health are closely interrelated. Education is the bedrock of human development and is the force through which economic and social policies generate knowledge that incentivizes people to promote greater economic growth [1]. Yet individual development calls for a basic minimum of health and well-being in order to become established. This is what has made health education such, as outlined in the objectives of the World Health Organization for 2015 and 2020 [2,3]. In order for people to develop they need to be empowered [4–6]. This need is increased in the area of maternal and child health because of its huge impact on the survival of individuals and the social/family environment [7]. The importance of parenting education programmes stems from the fact that they empower the woman and/or her partner at the time when they are most vulnerable: during pregnancy and the postnatal

period [8,9]. At an international level there is no question about the fact that the education of the future child starts in the womb, but according to the latest reviews there is a need for research to be undertaken to ascertain its benefits and the best educational approaches [10–27]. This research should include the approach and quality standards determined by international organizations [28,29]. The quality assessment models of educational programmes rolled out in the field of socio-educational intervention are not regularly applied in the field of health education [1]. In the review of the evaluation of prenatal education programmes, no studies have been found according to assessment models of socio-educational interventions [10–27]. The research team, in another project [30], reviewed and analysed the 11 main assessment models of socio-educational interventions to examine the possibility of applying them in the health care field, and determined that the Gento model (1996) [31] came closest to the quality

parameters used in health education [32–36]. Based on this model, a questionnaire-type tool was designed and validated ('EDUMA2') to analyse the quality of educational sessions in the third trimester of pregnancy [37]. The use of this tool will provide information on the current quality of these programmes. This information is important as the programme has a long history in the field of both public and private health. In Spain it was first implemented in the private sector in 1956 [38] and has formed part of the portfolio of National Health System services since 1983 [39]. This health system is organized in 17 regions with medical skills. Its overall objective is to provide knowledge and tools for the pregnant women herself and/or partner to learn healthy behaviours that support the development of a normal pregnancy, natural childbirth and parenting family welfare. Consequently, the results could serve as a reference for other research studies on the quality of prenatal education programmes worldwide.

### Purpose of the research

This study aimed to assess the quality of educational sessions held in the third trimester of pregnancy as part of the parenting education programme of the Spanish National Health System in the autonomous community of Madrid.

## Methods

### Design

The study used a cross-sectional descriptive study.

### Scope

The study was carried out in 41 primary health care centres in the seven health care districts that make up the Community of Madrid Health Area (central, north, east, south-east, south, west and north-west). As this is a programme given by primary health care midwives, all of them were offered the chance to collaborate in applying the questionnaire. This managed to avoid the affinity bias that would occur if the selection of collaborators were performed by the researcher. Of 172 midwives, 44 expressed an interest in collaborating. Their places of work were broadly representative of the seven health districts and therefore they were accepted. As 44 different health care professionals were involved in teaching the programme under evaluation, the result was a high level of heterogeneity in giving the classes.

### Participants

Attendees of the parenting education programme sessions on the third trimester of pregnancy who fulfilled the inclusion criteria (attendance of at least four sessions of the programme, having read the informative leaflet on the research study, having given their informed consent and completion of the questionnaire) comprised the study sample. The sample size was determined by the pilot study conducted with 18 questionnaires in which the main evaluation variable (question 48: overall satisfaction) was estimated as having a variability of 0.83; therefore, with a sample size of 700 questionnaires, a confidence index (CI) of 95% for an average would have a scale of  $\pm 0.087$  points. If the study were to analyse

each health district separately, with 100 questionnaires and in the same conditions as above, the CI of 95% for the average would have a scale of  $\pm 0.23$  points. The study period during which the information, questionnaires and informed consent forms were sent out and received ran from December 2010 to April 2011.

### Instrument

A questionnaire evaluating the quality of the educational sessions on the third trimester of pregnancy was used, known as EDUMA2. The methodology for drawing up the questionnaire and its reliability and validity (Cronbach's  $\alpha = 0.83$ ) were published recently [37]. The questionnaire contained 56 variables grouped into eight dimensions: health centre (one question with a nominal answer); evaluation of the attendee (10 questions with nominal answers); evaluation of the programme (18 questions on the organization, teachers and methodology, with Likert scale answers of 1–10); health habits and consumption of toxic substances (three questions with four categories of yes/no type answers); knowledge, confidence and bonding (16 questions with Likert scale answers of four categories for prior perception of knowledge, and four identical categories for the perception of knowledge acquired from the programme); and satisfaction (eight questions) [37] (Table 1).

The questionnaire was given at the end of the final session of the programme participants (pregnant women, their partners and/or companions). The variability of the sessions comprising the programme fluctuated between 5 and 10. The data were processed and analysed using the SPSS 15.0 (IBM-Corp, Armonk, NY, USA). A descriptive analysis was made of the defining variables of the study sample. In the case of qualitative variables, the absolute and relative frequencies were calculated for each category, and for the quantitative variables central tendency measures (average) and dispersion measures (standard deviation) were studied. To analyse the results, parametric tests were used such as the Pearson coefficient ( $r$ ) and the Student's  $t$ -test, as well as non-parametric tests such as chi-square test. All of them used  $P < 0.05$  as a level of statistical significance. The project was approved by the Pontificia Comillas University and the Research and Ethics Committees of the University Hospital of La Paz and observed the directives of current legislation (institutional review board) on research and ethical considerations.

## Results

An 'after the fact' or *ex post facto* evaluation was made; in other words, at the time of finishing the final session. The programme under evaluation was imparted by 44 different midwives working at 41 primary health care centres in Madrid during the mornings, 43.4% ( $N = 403$ ), or afternoons, 57% ( $N = 525$ ). The mean participation of centres by health district was 5.8. The questionnaire was given to 928 attendees, representing over 100 attendees in each of the seven health districts, following the indications of the calculation of the sample size (central 13.1%, north 16.7%, east 19.1%, south-west 14.9%, south 11.7%, west 11.3%, north-west 13.1%). The questionnaire was completed by 777 pregnant women (83.7%), 26 partners (2.8%) and 124 companions (13.4%). It has been referred to as partners who live with them in pregnancy, whether married or not and whether male or female. If the person next to them is their mother, sister, friend, etc., say it is their companion.

**Table 1** Questionnaire variables EDUMA2

Efficiency indicators of the education programme for pregnancy			
Health area	Centres	Professional	Time
Date			
Social and health risk factors of pregnant women	Age: </= 19 years old >40 years old Uptake: pregnancy >24 weeks	Educational level: -No qualifications -Compulsory education Parity: >2 children Immigration	Occupational situation: mother unemployed with no benefits Occupational situation: partner unemployed with no benefits
			Social: no stable partner (not living with a partner) Social: no support from family/social circle
Practicality indicators of the education programme for pregnancy (Likert 1–10)			
Organization	Prior information Accessibility of the programme Friendliness The teaching method helps me to learn The explanations are clear	Facilities: cleanliness Duration of sessions Professionalism Any queries are clarified Participants are invited to give their opinions People feel comfortable expressing their concerns and fears	Facilities: signage Facilities: comfort Time/dedication The professional makes sure she is understood If something is not understood the professional will explain again
Teachers			Resources (mattresses, etc.) Optimal number of participants
Methodology			
Effectiveness indicators of the education programme for pregnancy			
Consumption of toxic substances	Consumed before pregnancy Consumption reduced by programme	Cigarettes Cigarettes Habit improved Habit did not improve Habit improved Habit did not improve Before/after Before/after Before/after Before/after Before/after	Alcohol Alcohol Newborn baby Breastfeeding Emergency signs Breathing techniques Relaxation techniques
Health habits	Eating Exercise During the pregnancy During birth During the postnatal period Physical exercise pregnancy Pelvic floor exercises Satisfaction level (Likert 1–10) Educational sessions Suggestions or complaints	Drugs Drugs Rest Pregnancy care	Non-prescription medicines Non-prescription medicines Habit improved Habit did not improve Habit improved Habit did not improve Before/after Before/after Before/after Before/after Before/after
Knowledge of CARE (Likert 1–4 before/after)			
Knowledge of TECHNIQUES (Likert 1–4)			
Satisfaction		Would recommend the programme Programme sessions	Would recommend the health care professional Most informative sessions Least informative sessions
Impact indicators of the education programme for pregnancy (Likert 1–4 before/after)			
Feeling of control (confidence)	About the pregnancy About labour About the postnatal	Before/after Before/after Before/after Before/after	About breastfeeding About caring for the baby Before/after Before/after
Bonding with the baby			

**Table 2** Results: efficiency indicators of the education programme pregnancy

Subcriteria	Categories	Total no.	Study collaborators	%
Centres	Primary health care centres, Community of Madrid	258	41	16
Professional	Primary health care midwives, Community of Madrid	172	44	39
Population	Number of births per year, Community of Madrid	72 514	777	1.1
Subcriteria	Categories	Average	Minimum	Maximum
Time	Number of sessions given per programme	7	5	10
	Time devoted to teaching programme	14	10	20
Sub-criteria	Categories	No. of questionnaires	F	%
Time	Morning	928	403	43.4
	Afternoon	928	525	56.6
Social and health risk factors of pregnant women	Age: ≤ 19 years old	777	777	0.4
	>40 years old	777	777	3.3
	Parity: >2 children	777	776	3.6
	Uptake: pregnancy >24 weeks	777	765	7.7
	Educational level:			
	–No qualifications	777	760	3.2
	–Compulsory education	777	760	14.1
	Occupational situation: mother unemployed with no benefits	777	775	12.2
	Occupational situation: partner unemployed with no benefits	777	774	3.6
	Social: no stable partner (not living with a partner)	777	746	1.9
Social: no support from family/social circle	777	927	8.7	
Immigration: from Europe (4.9%), North America (1.7%), Central and South America (6.5%), Asia (0.1%), North Africa (0.6%), Central and South Africa (0.8%), Oceania (0.1%)	777	774	14.7	

The results were grouped according to the quality model of the questionnaire [31], which covered four types of indicators: efficiency (time and resources), practicality (propositions and process), effectiveness (successes and failures) and impact (effects and consequences).

### Efficiency indicators

The efficiency indicators take into account the ratio between the results achieved and the resources used. Therefore, they try to determine the optimum outcome of a project and the influence of the starting point (essentially the context factors and the available resources) on the effects achieved. In a programme of health education that seeks to empower the population, it is important to capture people with higher social health risk. The questionnaire includes as risk factors in pregnancy the mother's age, educational level, employment status, employment status of their partner, multiparity, control after 24 weeks of pregnancy, immigration, single mothers, family and social networks (Table 2).

### Practicality indicators

The practicality indicators aim to evaluate the suitability of the execution process of the project itself, regardless of the results obtained and, as far as possible, the resources implemented. The

questionnaire contained 18 practicality indicators grouped into three dimensions: organization, teaching staff and methodology (Table 3).

### Effectiveness indicators

The effectiveness indicators are intended to ascertain whether the planned activities managed to achieve the expected results. The indicators gathered relate to the objectives of the programme in terms of changes in the consumption of certain substances during pregnancy, improvements in health habits, increased health care knowledge, increased knowledge of techniques (breathing, relaxation, exercises and massage) and participants' satisfaction levels. With regard to knowledge-related questions, participants were asked about their perceived knowledge of each aspect both before and after the programme using the same Likert scale of four alternatives, allowing an evaluation to be made of participants' perception of the change in their knowledge resulting from the programme (Tables 4 and 5).

### Impact indicators

The indicators demonstrate the impact that a project has on the incidence area of its results, but independently of those results. The evaluation tool used only addressed two impact factors: the change in the feeling of control, or confidence, of the participants

**Table 3** Results: practicality indicators of the education programme pregnancy

Subcriteria	Categories	N	Average values from 1 (-) to 10 (+)	$\sigma$	% Grouped values = 0 > 7
Organization	Prior information	926	7.3	2.4	67
	Accessibility of the programme	927	7.9	1.9	79
	Duration of sessions	926	8.3	1.5	90
	Facilities: cleanliness	926	8.6	2.2	91
	Facilities: comfort	927	7.6	1.9	74
	Facilities: signage	926	8.1	1.7	83
	Resources (mattresses, etc.)	925	8.1	1.7	82
	Optimal number of participants	926	8.1	1.9	82
Teachers	Teachers: friendliness	927	9.5	0.8	99
	Teachers: professionalism	927	9.6	0.8	99
	Teachers: time/dedication	926	9.5	0.9	99
Methodology	The teaching method helps me to learn	928	8.9	1.2	96
	The explanations are clear	928	9.1	1.1	98
	Participants are invited to give their opinions	925	9.3	3.1	98
	Any queries are clarified	927	9.3	1.0	99
	People feel comfortable expressing their concerns and fears	928	9.3	1.1	97
	The professional makes sure she is understood	927	9.5	0.9	99
	If something is not understood the professional will explain again	927	9.4	1.0	98
	Average	926	8.7	1.5	91

thanks to the programme in relation to pregnancy care, childbirth, the postnatal period, breastfeeding and the newborn baby; and the increase in positive bonding with the future child. For these questions, the participants were asked about their perception of confidence in every aspect both before and after the programme (Table 5).

## Discussion

No studies evaluating prenatal educational programmes based on standardized models could be found with which to make a comparison, so this work establishes a benchmark for future research. Knowledge of the quality factors of a health education programme allows professionals and/or administrations to reorganize their resources and draw up specific strategies for improving their interventions [5,6]. The biggest limitations of the work are that the study is restricted to a single community in the Spanish National Health System and that the tool used is only validated in Spanish. These characteristics are also the study's greatest asset, as they can provide a reference for other Spanish-speaking regions of the world that are planning to conduct a research on the quality of prenatal educational programmes. It can also serve for researchers of other languages to look at validating the tool in their own language, or for them to build evaluation tools according to quality models.

The use of the EDUMA2 tool facilitates the collection and analysis of results from the perspective of the quality of the programme under study. Its design allows the impact of the programme on the participants to be distinguished according to the pregnant women themselves or their partners and/or companions in order to better adjust the programme to parents as recommended by the latest reviews [10–27]. However, in this study the completion of the questionnaire by partners and companions was much

lower than the anticipated 45% [40], which might indicate the need to explain more clearly that the questionnaire needs to be completed by *all* the people attending the programme and not just one questionnaire per family unit.

The efficiency indicators of the tool do not reflect factors related to costs or the consumption of resources, so these should be evaluated by the administration separately. The time devoted to the programme and the times at which sessions were given, morning and afternoon, was similar to the 2008 study [40], which indicates that the structure of the programme and the flexibility of attendance times have been maintained. Evaluating the uptake rate in terms of the risk factors of pregnant women is a complex task due to the difficulty in ascertaining the incidence of each factor; however, taking into account the data on the Community of Madrid [41,42], the results indicate that the programme is efficient in the uptake of pregnant women in the risk brackets of being over 40, multiple births and immigrants from Europe and America. However, improvements need to be made in the uptake of pregnant women in the risk brackets of under 19, low income, uptake after 16 weeks and immigrants from Africa and Asia.

The mean of the practicality indicators, on a scale of 1–10, was 8.7 and the rating was higher than 8 in 90.5% of the cases studied. These data indicate that the programme is highly practical in terms of its organization, teaching staff and methodology. These data are interesting given the importance that these quality indicators are acquiring as a result of studies on the dynamics of human processes in general, and educational processes in particular, which show that relationships between the participants involved give rise to a particular internal climate which, on many occasions, leads to emotionally close relationships and positive stimuli that are much more valuable than the simple results of the learning process [43–46].

**Table 4** Results: effectiveness indicators of the education programme pregnancy

Categories	Answered question		Consume substances		DO NOT consume them	
	N	%	F	%	F	%
Consumption of toxic substances	888	95.7	256	27.6	632	68.1
	843	90.8	217	23.4	626	67.5
	781	84.2	15	1.6	766	82.5
	804	86.6	83	8.9	721	89.7
	Answered question		Consumption reduced		Consumption NOT reduced	
Categories	N	%	F	%	F	%
Consumption reduced by programme	434	46.8	221	23.8	213	23
	384	41.4	189	20.4	195	21
	671	72.3	56	6.0	201	22
	320	34.5	92	9.9	228	25
	Answered		Habit improved		Habit did not improve	
Categories	N	%	F	%	F	%
Health habits	862	92.9	622	67.0	240	26
	850	91.6	590	63.6	260	28
	809	87.2	553	59.6	256	28
	864	93.1	795	85.7	69	7
Satisfaction	Questionnaires		X-values 1 (-) to 10 (+)		% Values = 0 > 9	
Satisfaction level	928	8.93			1.1 67.5	
	No answer		YES		NO	
Categories	F	%	F	%	F	%
Would recommend the programme	2	0.2	923	99.5	3	0.3
	11	1.2	912	98.3	5	0.5
	3	0.3	172*	8.5	753	1.0
Educational sessions	N		X sessions programme		σ attendance programme	
	928	7.5	6.8		0.9	
	928	Birth and postnatal care				
928	Health care and changes during pregnancy					

\*47 requests for practical sessions, 31 thanks and 21 complaints about too many participants.



**Table 5** Results: effectiveness indicators of the education programme pregnancy

	Categories	Time	<i>N</i>	<i>X</i>	$\sigma$	Student's <i>t</i> -test	d.f.	<i>P</i>	<i>d</i>
Knowledge of CARE	During pregnancy	Before	927	2.48	0.788	47 841	926	0.000	1.76
		After	927	3.64	0.495				
	During birth	Before	926	2.08	0.833	57 373	925	0.000	2.15
		After	926	3.58	0.527				
	During postnatal period	Before	927	2.05	0.864	53 570	926	0.000	2.05
		After	927	3.54	0.558				
	Breastfeeding	Before	927	2.13	0.899	52 463	926	0.000	1.98
		After	927	3.60	0.564				
	Newborn baby	Before	928	2.34	0.967	39 908	927	0.000	1.48
		After	928	3.55	0.648				
	Emergency signs	Before	927	2.16	0.892	50 078	926	0.000	1.89
		After	927	3.61	0.623				
Knowledge of TECHNIQUES	Physical exercise pregnancy	Before	928	2.12	0.835	44 273	927	0.000	1.73
		After	928	3.40	0.644				
	Pelvic floor exercises	Before	928	1.99	1.36	-32 024	927	0.000	1.37
		After	928	3.45	0.648				
	Breathing techniques	Before	928	1.97	0.847	50 608	927	0.000	2.11
		After	928	3.51	0.600				
	Relaxation techniques	Before	928	2.08	0.869	44 883	927	0.000	1.82
		After	928	3.46	0.632				

Results: impact indicators of the education programme pregnancy

	Categories	Time	<i>N</i>	<i>X</i>	$\sigma$	Student's <i>t</i> -test	d.f.	<i>P</i>	<i>d</i>	
FEELING OF CONTROL (CONFIDENCE)	About pregnancy	Before	928	2.37	0.742	-37 562	927	0.000	1.36	
		After	928	3.27	0.570					
	About labour	Before	928	2.04	0.780	-40 109	927	0.000	1.51	
		After	928	3.11	0.633					
	About postnatal	Before	928	2.17	0.730	-40 796	927	0.000	1.50	
		After	928	3.16	0.585					
	About breastfeeding	Before	928	2.24	0.810	-40 198	927	0.000	1.42	
		After	928	3.26	0.615					
	About caring for the baby	Before	928	2.35	0.823	-37 064	927	0.000	1.29	
		After	928	3.28	0.618					
	BONDING WITH THE BABY	Positive affective relationship with the baby	Before	928	3.18	1.013	-20 593	927	0.000	0.53
			After	928	3.67	0.834				

d.f., degree of freedom in Spain.

The efficiency indicators show a drop in the consumption of toxic substances, an improvement in health habits, a significant increase in the perception of knowledge and high satisfaction levels, as well as specifications of the improvements called for by the population that will allow specific strategies to be designed to increase quality. These include the need to continue working to reduce the consumption of toxic substances and encourage participants to partake in some form of physical exercise, which is the only area that failed to show a significant change. The attendance levels of the programme were generally high, which indicates its suitability for the needs of pregnant women. In this respect, the childbirth session was the most highly attended and valued session, followed by the session on the postnatal period. This indicates that labour continues to be the key element of the programme and that the postnatal period is of increasing concern to the population.

The impact indicators studied an improved feeling of control or confidence and increased bonding are very new and positive evalu-

ation criteria. The improvement in the feeling of control and confidence is directly related to perceived self-efficacy [47], which tells us about the capacity of the person to cope with new situations, in this case the development of coping skills for the elements being studied: care in the third trimester of pregnancy, during labour, in the postnatal period, during breastfeeding, baby care and the signs and symptoms that mean it should be taken to accident and emergency. This feeling of control and confidence has only been covered in the study by Koehn [48], in which it turned out to be one of the main benefits of prenatal education programmes thanks to its positive impact on women's quality of life through the 'empowerment effect' [4-7]. In this study, the average of the values obtained from the difference between the perception of confidence before and after the programme indicates an increase in confidence of 74.8% and as the results are significant in every aspect it can be asserted that the programme increases women's perception of control and confidence with regard to the factors studied (Table 5). The other impact

factor studied, the difference between positive bonding relationship before and after the programme, turned up significant positive results (Table 5), but not as high as those for confidence, given that the feeling of bonding prior to the programme was already very high. The fact that the sense of bonding before the programme started was already mainly positive indicates that the participants had a good attitude towards their pregnancy, and this fact demonstrates the good work of the health care professionals (obstetricians, primary health care doctors and midwives) involved in monitoring the pregnancy and the first level of maternal education (sessions held before the 28th week of pregnancy). This factor is important from the perspective of human development, according to the attachment theory [49], which claims that people who have unconditionally affectionate relationships or secure bonds in their childhood develop into secure and balanced individuals, which further facilitates human relations and personal growth. Therefore although it may seem that this work only provides results on two impact indicators, the elements it covers have a very important impact on the childbirth experience and the upbringing and development of this new individual, according to Bandura's self-efficacy theory (1999) [47], and Bowlby's attachment theory (1990) [49].

### Implications for practice

This study has enabled an analysis to be made of a pregnancy education programme from the perspective of a quality model [31] by means of the questionnaire in accordance with its educational objectives and the appropriate psychometric characteristics [37]. The results justify the continuation of the programme and suggest that the other health education programmes on major diseases should be seen in the public health (obesity, depression etc.)

This work highlights the strengths and the areas for improvement of the programme as well as the need to establish regular evaluation strategies. It also suggests the need to develop tools that will allow the quality of the other two levels of the programme to be assessed (educational sessions pre-28 weeks and during the postnatal period) to provide a complete overview and better knowledge of the medium- and long-term impact [50]. The results and proposals for improvements deriving from this study will be of benefit to health institutions that can assess the quality of their programmes, to the health care professionals who plan to analyse their interventions in order to provide more efficient and effective care and to all future parents who will be able to receive health care that helps to empower them with a view to better maternal and child health.

### Conflict of interest

The authors declare no conflict of interest.

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