Screening Hospitalized Pregnant Women for Possible Distress: A Comparison of the Clinical Usefulness of Two Screening Measures

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Article

Screening Hospitalized Pregnant Women for Possible Distress: A Comparison of the Clinical Usefulness of Two Screening Measures

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Abstract: Pregnancy is a period of great complexity and potential psychological vulnerability which may increase in unfavorable conditions, such as hospitalization. Therefore, early identification of emotional, anxious or depressive difficulties is important in terms of maternal and fetal well-being. International guidelines recommend the use of brief screening tools to identify perinatal women for further investigation, but which measure is optimal remains to be clarified. The objective of this study was to compare the Whooley depression questions used together with the Generalized Anxiety Disorder-2 (GAD-2), versus the Matthey Generic Mood Questionnaire (MGMQ), to evaluate their concordance in screening results and their clinical usefulness in the hospital setting. 228, hospitalized pregnant women, and some of their partners, completed both questionnaires, and expressed their satisfaction and ease of completion of each. Results showed high similar screen positive rates on both measures, but the screen positive concordance between the two instruments was low (around 50%). The Whooley/GAD-2 missed a significant percentage of women who, on the MGMQ, wished to talk with a professional, or who expressed moderate to high distress. Findings suggest that screening is important in hospitalized women, and clinicians should consider the respective merits and possible weaknesses of different screening tools.

Keywords: screening; pregnancy; anxiety; depression; hospitalization; risk

1. Introduction

Motherhood is a phase of great complexity and it is recognized that under unfavorable conditions it can lead to potential psychological vulnerability [1]. The prevalence of probable distress (depression or anxiety) in women during pregnancy is estimated to be around 20% [2–4] with a noteworthy increase in the post-covid period especially in low-income population [5,6]. The risk of experiencing perinatal emotional difficulty may increase under particular conditions, including hospitalization during pregnancy [7]. Furthermore, the consequences of perinatal maternal distress on the woman's and fetus health, and the newborn's development, have been widely documented [8,9], drawing attention to the importance of prevention. Literature also shows that approximately 10% of men report symptoms of perinatal depression or anxiety [10,11].

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A recent metanalysis has highlighted that in hospitalized pregnant women the percentage of depression and anxiety doubles compared to the general population [12] and a further study found a higher percentage of suicidal thoughts [13].

Health problems that require hospitalization can affect the woman's emotional well-being and cause concerns about the progress of the pregnancy or the health of the unborn child, significantly threatening the sense of continuity in the psychological process of transition to parenthood, also hindering the development of the maternal attachment to the fetus [14,15]. An abrupt and unexpected admission to the hospital can increase anxiety levels in pregnant women [16] and furthermore, the presence of distress can also affect men, who fear possible consequences for the health of their partner and the fetus, and experience their and their children's distress due to the woman's absence from home. For all these reasons, carrying out a screening of the emotional distress that hospitalized pregnant women (and their partners) experience can be important so that timely management of perinatal distress is possible [17–19].

In recent years, routine universal screening for perinatal anxiety and depression symptoms have been put in place in several countries (e.g. England, Australia, Italy), with international guidelines recommending different measures. The National Institute for Health and Care Excellence (NICE) guidelines [20], currently recommend the two Whooley depression questions [21], together with the GAD-2 anxiety questions [22,23], as the first step in perinatal mental health screening. These screening measures take a symptomatic approach to detecting possible distress, and use a 'cut-off score' on each to determine if a woman needs further assessment.

Recent research [24] has however detected several problems with these screening measures. In particular, when completing the Whooley questions, about 15% English-speaking women completely misinterpret the Anhedonia Question (which investigates the inability to experience joy or interest), or have difficulty understanding it (about 17%). It has also been discovered that endorsement of the anhedonia symptom is often due to the normal physical changes in pregnancy, and not due to low mood (about 65%) [24,25].

In addition, given that different measures often don't enquire about identical symptoms for the same construct, it is not surprising that concordance between various validated perinatal emotional health screening measures can be quite low [26–28]. Condon and Corkindale [27], for example, found that only between 28% and 56% of women who screened positive on one measure, based on depression symptoms and their frequency, also screened positive on another measuring the same construct. To overcome these and the prior mentioned problems it has been proposed a different type of emotional health screening measure, the Matthey Generic Mood Questionnaire (MGMQ) [29,30].

The MGMQ differs from the Whooley questions plus GAD-2 (from now on called W-G) (and other similar measures) in that it enquires about the construct of feeling 'distressed', rather than asking about specific symptoms. It asks a woman directly how much she is "bothered" by her feelings, and also whether she wishes to talk to a health professional about how she is feeling. It is the answers to these latter two questions that determines if a further assessment is required.

Considering the importance of early identification of possible distress in hospitalized pregnant women, a research project with the aim to evaluate the relative merits of the W-G and MGMQ has been implemented in the clinical setting of the Obstetrics Department of Spedali Civili di Brescia, a public hospital in a medium-sized city in the Lombardia region in northern Italy.

The overall objective was to understand the comparative performance of the W-G and MGMQ in Italian speaking women hospitalized during their pregnancy. Where possible, the women's partners were also offered the opportunity to participate, in order to assess their level of distress.

1.1. Research Questions

The research questions concerned the comparative performances between the W-G and the MGMQ for Italian women in this particular clinical setting, with respect to: a) satisfaction with, and preference for, the two measures; b) interpretation of the Anhedonia and MGMQ questions; c)

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attribution of the anhedonia symptom to low mood or physical changes in pregnancy; d) screen positive concordance between the W-G and the MGMQ.

2. Materials and Methods

2.1. Procedure

Ethics approval was obtained from the Ethics Committee of the Brescia's public hospital (Spedali Civili di Brescia). All participating women and men signed the Ethic's approved consent form. Women admitted to the Obstetric Department with pregnancy complications or other medical conditions, from September 2022 to March 2023 were recruited by the Project Officer (PO), a research psychologist, if they met the following criteria: Italian speaking; admitted between Monday and Friday; the admission was for pregnancy complications or other medical reasons, but not for an emergency requiring an immediate surgical or similar intervention.

Eligible participants were recruited within 2 days of being admitted to the Obstetrics Department. Several different POs were involved in the Project; each woman who had a male partner was asked if she gave permission for the PO to contact him, to see if he would consent to also participate in completing the questionnaires for himself, via telephone or in person. Confidentiality was assured to the woman (and man if he participated) that the answers on the forms would not be communicated to the partner. After completing the questionnaires, women were asked questions by the POs to clarify any responses, verify their understanding of the questions, and their satisfaction with the two measures.

If a woman screened positive on any of the questionnaires (i.e. W-G or MGMQ), she was offered the appropriate professional support routinely given to all inpatients from the psychologist specialist of the obstetrical unit. All measures, and communications, were in Italian.

2.2. Measures

2.2.1. Modified Whooley Questions

The Whooley questions [21] are the two core-depression diagnostic questions in the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, which respectively investigate symptoms of low mood and anhedonia [31]. The original two Whooley questions use a time frame of the past month. This was changed to the 'past 2 weeks' for this study, as has been done in previous research [24], so as not confuse participants, given that both the GAD-2 and the MGMQ (see below) enquire about the past 2 weeks. Thus, in English the modified Whooley questions are: "1. During the past 2 weeks have you often been bothered by feeling down, depressed or hopeless? (Low Mood Question)"; 2. During the past 2 weeks have you often been bothered by having little interest or pleasure in doing things?" (Anhedonia Question). The response options for each question are 'Yes' or 'No', as per the original Whooley questions. A response of 'Yes' on at least one of the questions is considered to be 'screen positive' for possible depression. A sensitivity value of 100% for the diagnosis of depression was found for Whooley questions in a UK perinatal validation study [32] , and in an American postnatal study [33]. Though of note is that a recent Chinese validation study [34] found a much lower sensitivity of 77%, and a very high proportion of false positives (positive predictive value of only 0.2).

2.2.2. GAD-2.

The Generalized Anxiety Disorder-2 (GAD-2) is the short version of Generalized Anxiety Disorder-7 [22], it comprises two questions regarding anxiety: "Over the last 2 weeks, how often have you been bothered by the following problems?: 1. Feeling nervous, anxious or on edge; 2. Not being able to stop or control worrying". The response options for each question (with their respective score in brackets) are: 'Not at all (0); Several days (1); More than half the days (2); Nearly every day' (3). A total score of 3 or more across the two questions is considered to be screen positive.

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The GAD-2 performs well in the general population [23], but there are not many perinatal validation studies. A study highlighted some limitations of GAD-2 in generating many false positives [35] and a more recent study [36] found in a perinatal English-speaking sample that a score of 2 or more performed better than the usually recommended 3 or more.

2.2.3. MGMQ.

The MGMQ [29,30] consists of four questions: Q1. A Distress question (with a time frame of during the past 2 weeks): 'Have you felt very stressed, anxious, or unhappy, or found it difficult to cope, for some of the time?' (response options: 'Yes', 'Possibly', 'No'); Q2. A Bother Impact question (for those who answered 'Yes' or 'Possibly' to the Distress question): 'How bothered have you been by these feelings?' (response options: 'Not at all'; 'A little bit'; 'Moderately'; 'A lot'); Q3. A Reason for distress question, asking the individual why she is feeling this way (if appropriate, and only if she wishes to describe this on the questionnaire): Q4. A wish for referral question: 'Would you like to talk to a health professional about any of these things?' (response options: 'Yes', 'Possibly', 'No').

This measure has performed well for women in antenatal and postnatal clinical settings against diagnostic criteria for depression and anxiety, and against various self-report measures of anxiety and depression, for English-speaking women [29,30,37,38], and for Italian-speaking women and men [39,40], and also Arabic-speaking postpartum women[41]. Screen positive responses on the MGMQ are:

(i) Moderate/Major distress: an answer to question Q2 (Bother Impact question) equal to: 'Moderately (bothered)' or 'A lot (bothered)'; and/or on Q4 (Wish to talk question): 'Yes (I want to talk with a health professional about how I am feeling)'.
(ii) Minor distress: an answer to question Q2 equal to: 'A little bit (bothered)', together with on Q4: 'Possibly (I want to talk with a health professional about how I am feeling)'.

The Moderate/Major distress classification was determined by consulting with Italian clinicians [39], as well as the measure's performance against diagnostic criteria [30], while the Minor distress classification was determined by clinical considerations.

2.2.4. Women's Views, Understanding, and Interpretation of the Measures

A series of questions were developed to understand what the women thought of the different measures. Some of these questions were partly derived from previous research on these issues (cf., [24,25]). The questions explored: i) the women's opinions of each measure, and whether they had a preference for one or the other; ii) whether or not they had correctly understood the Whooley Anhedonia Question, and the MGMQ Bother Impact question (MGMQ Q2); iii) whether they attributed the anhedonia symptom (if applicable) to their mood / worries, or to the usual physical symptoms and changes of being pregnant; iiii) whether on the MGMQ Q2 and Q4 they preferred the current response options, which includes the option of saying 'Possibly', or whether they considered it would be better to just have the options of 'Yes' and 'No'. Men were not asked these questions due to the practical limitation of not having face-face contact with most of these participants.

2.3. Sample Size

To report on the percentage of women screening positive on each measure, with an accuracy of + / - 5% at the 90% confidence level, with a screen positive rate of at least 30% (given that this was a 'high-risk sample of women, and thus would be expected to have a higher screen positive rate than a normal community sample), a sample size of 219 was required [42]. This sample size was achieved for the women (N = 228), but not, as was anticipated, for the male partners. The rates and other data reported for the men therefore should be treated very cautiously.

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2.4. Statistical Analyses and Effect Size

Data were analyzed in terms of frequences and proportions. As has been reported in similar research [24], to ascertain clinically meaningful differences in the analyses, the effect size was used. As proposed by Rosenthal (1996) the 'percentage point difference' method suggests that when the smaller percent is between 7% and 15%, a medium effect size is 12 percentage points difference, and a large effect size is 20 percentage points difference. When the smaller percentage is between 15% and 85% a difference of 7 percentage points is a small effect size, 18 percentage points is medium, 30 percentage points is large, and about 45 percentage points is a very large effect size.

3. Results

3.1. Participants

3.1.1. Women

Hospitalized women were recruited consecutively on the mornings of non-holiday Mondays through Fridays. 245 women met the study's inclusion criteria (see Procedure). Of these women, 17 chose not to participate, while 228 provided full or partial data (93% uptake rate). All women were given the screening scales in Italian, by the PO, and completed them in person.

3.1.2. Men

46 women declined to give their partner's details, 3 did not have a partner, and a further 18 men when contacted declined to participate. From the 152 men then contacted, 97 declined to participate, while 55 chose to participate and provided full or partial data (36% uptake rate of those contacted). Of these 55 men, 36 completed the forms via a phone interview with the PO, 18 completed the physical forms at home (and returned them via email), and one completed them in person in the hospital with the PO.

3.2. Demographics

The sample was mainly composed of Italian women (and some of their partners), partnered, highly educated, primiparous and in the third trimester of gestation. The reasons for hospitalization were mostly related to pregnancy problems (52%: e.g. increased blood pressure, preeclampsia), general health reasons (23%: e.g. minor accidents, renal colic), risk of preterm birth (20%: e.g. preterm contractions, shortening of the uterine cervix), with the remaining 5% having missing data. The demographic information for the participants is displayed in Table 1.

Table 1. Demographic characteristics of the sample.

	Women (N=221-228)	**Men (N=48-55)**
	Age	
Age range (years) (mean, SD)	18-48 (33.4; 2.8)	25-49 (35.3; 5.8)
	Weeks pregnant	
Weeks pregnant: Range (% 1st trimester; 2nd trimester; 3rd trimester)	4-40 (3.6%; 19.2%; 77.2%)	12-40 (2%; 22%; 76%)
	Marital status	
Married/ Partnered	94%	100%

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Education level		
Tertiary (university)	43%	35%
Ethnicity		
Italian	81%	94%
Other European	13%	6%
Non-European	6%	0%
Other children		
No	61%	69%
Administration of measures		
Face-face	100%	2%
Telephone	0%	67%
At home	0%	31%
Reasons for hospitalization		
Risk of pre-term birth	20.17%	n.a.
General health reasons	22.80%	n.a.
Pregnancy complications	51.75%	n.a.
Data missing	5. 26%	n.a.

3.3. Rates of Positive Screening and Distress' (MGMQ) Differences Among Women Hospitalized for Different Reasons.

Rates of positive screening in women were 35.5% on the W-G and 33.9% on the MGMQ while in men were 20% on the W-G and 15.1% on the MGMQ (Table 3). There was a small-moderate greater percentage of women with mild or moderate-major distress in the women admitted for pre-term birth reasons (46%), compared to those admitted for pregnancy complication reasons (31%), and those admitted for general hospitalization reasons (29%). The percentage point differences was of 15 and 17 respectively, thus small-moderate effect size.

3.4. Women: Perception and Understanding of the Measures

As shown in Table 2, the rate of satisfaction for each instrument was high, and there was a greater proportion of women preferring the MGMQ over the W-G (50% vs 37%: 13 percentage points difference: small-to-medium effect size).

Reasons why women said they preferred one or other of the measures were similar. Some women said that they preferred the MGMQ because of its open question (Q3), where they could express how they felt, whereas others said the opposite – that they preferred the W-G because it didn't have such an open question and therefore it is quicker to respond. Similarly, some preferred the MGMQ saying that it was easier to understand, while others felt that the W-G was easier to understand.

There was a substantially stronger preference for the inclusion of the response option of 'Possibly' in both the MGMQ Distress (Q1) and Wish-to-talk (Q4) questions (both with 30 or more percentage points difference: thus a large effect size). Reasons included that some women may not wish to admit saying 'Yes' to such questions, and thus having 'Possibly' gave them an easier way of admitting that they felt distressed, or wanted to talk to someone. Others said that 'Possibly' was a good option as some women may be unsure of exactly how they are feeling (Q1), or whether or not they wanted to talk to someone (Q4).

Of note is that four women completely misinterpreted the Whooley Anhedonia Question (saying 'No' to this question, but in fact they meant to say 'Yes' when the question was checked by the PO), and one found it confusing. No women however misinterpreted the MGMQ Distress Impact question

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(Q2). Of those who endorsed the Whooley anhedonia symptom (N= 17), around half (n = 8) said that it was just due to the physical symptoms of pregnancy and not due to low mood or worries. For example, some said that having to stay at home and rest, due to their pregnancy complication, meant they couldn't enjoy things like they used to.

Table 2. Women's perceptions of the measures.

	Women (N= varies per question)
Both measures	
% Satisfied with each measure *(N=195-197)*	
MGMQ	93%
W-G	89%
Preference for the measures *(N=189)*	
MGMQ preferred	50%
W-G preferred	37%
No preference	13%
MGMQ measure	
Q1 Response options: Preference *(N=146)*	
Only include 'Yes/No'	32%
Also include 'Possibly'	67%
Unsure (n=1) / Missing (n=1)	1%
Q4 Response options: Preference *(N=146)*	
Only include 'Yes/No'	29%
Also include 'Possibly'	71%
Q2 Impact question *(N=123)*	
Correct interpretation	100%
Whooley Measure	
Anhedonia Question comprehension *(N= 144)*	
Interpreted incorrectly	3% (n=4)
Had difficulty understanding it	<1% (n=1)
Attribution of endorsed Anhedonia Question (N= 17)	
Just due to physical changes	47% (n=8)
Includes due to mood or worries	53% (n=9)

3.5. Women: Wish-to-talk to a Health Professional and their Reasons (MGMQ Q3 and Q4)

Table 3 shows that 23.7% of the women either said 'Yes', or 'Possibly', to the Q4, Wish-to-Talk, question. Their reasons included i) Problems or concerns with their pregnancy (e.g., 'feeling very worried that something may happen to their infant; concern about the possibility of an abortion, having previously experienced this); ii) Concern that they may not have enough support, or may not cope with everything, once the baby is born (e.g. due to moving house, having to work, and the mother's own health); and iii) Interpersonal difficulties or stresses (e.g., concerns regarding her relationship with her partner; her own mother's poor health). There is however no clear pattern as to the reasons a woman wants to, or does not want to, talk with a health professional. This will probably depend upon a variety of factors, including the level of distress she is experiencing, her own coping style, her support systems, and her previous experiences at receiving help.

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Of note is that on the MGMQ, the wish to talk with a health professional (Q4) was not always related to the degree of 'bother' a woman reported on the MGMQ's Q2. Thus, 7 of the 16 women saying 'Yes' they wanted to talk with someone said that they were only 'A little bit' bothered by how they were feeling (Q2). This was also evident for those saying they 'Possibly' wanted to talk with a health professional (16 of the 37 women were only bothered 'a little bit').

Furthermore, for women being positive on the Impact question of the MGMQ (Q2: saying that they were bothered either 'Moderately' or 'A Lot': N=54), this did not necessarily mean that they wanted to talk with a health professional. Of these 54 women, 27 (half) said that they did not want to talk with a health professional.

Table 3. Percentage screening positive on the W-G and the MGMQ questions (n stated when 4 or less).

	Women (N= 227-228)	**Men* (N= 53-55)**
Measures: % screening positive		
W-G[1]	35.5% (+/- 5%)	20.0% (+/- 8.8%)
Whooley[2]	31.6% (+/- 4.9%)	12.7% (+/- 7.3%)
GAD-2[3]	15.8% (+/- 3.8%)	10.9% (+/- 6.9%)
Positive on both the Whooley&GAD-2	11.8% (+/- 3.4%)	3.6% (n=2)
MGMQ		
Minor or Mod/Major distress	33.9% (+/- 5%)	15.1% (+/- 7.9%)
Minor distress[4]	7.0% (+/- 2.7%)	1.9% (n=1)
Moderate/Major distress[5]	26.9% (+/- 4.7%)	13.2% (+/- 7.5%)
MGMQ Q2: % Bothered		
Moderately	19.8% (+/- 4.2%)	11.3% (+/- 7.0%)
A lot	4.0% (+/- 2.1%)	1.9% (n=1)
A little + 'Possibly' on Q4	7.0% (+/- 2.7%)	1.9% (n=1)
MGMQ Q4: % Wish-to-talk with a health professional		
Yes	7.5% (+/- 2.8%)	0%
Possibly	16.2% (+/- 3.9%)	3.8% (n=2)
No	36.0% (+/- 5.1%)	30.2% (+/- 10.1%)
Not applicable[a]	39.9% (+/- 5.2%)	58.5% (+/- 10.9%)
Missing:	n=1	0%

Note: 90% Confidence intervals (CI) reported in brackets for the women's data. For the men's data, due to the small sample size, the 90% CI is only reported when the percentage is 10% of more. Otherwise the n is reported. * Interpret these results with caution, due to the small sample size for men. [1] Positive on either, or both, of the Whooley or GAD-2. [2] At least one Whooley question answered 'Yes'. [3] A total score across the 2 questions of 3 or more. [4] A little bit bothered (Q2) and 'Possibly' want to speak (Q4). [5] 'Moderately' or 'A lot' bothered (Q2); and/or 'Yes' wants to talk (Q4). [a] Responded 'No' on Q1, or 'Not at all' on Q2.

3.6. Men: Wish-to-talk to a Health Professional and their Reasons (MGMQ Q3 and Q4)

Table 3 shows that a much smaller percentage of men, compared to women, said that they wanted to talk with a health professional (0% 'Yes'; 3.8%: 'Possibly'). The reasons these two men (3.8%) gave for feeling 'distressed' included one having to cope with work, moving to a new house, and the pregnancy, without wanting to burden his partner with these stressors; and the other man's partner had experienced a misdiagnosis requiring admittance to hospital and he had difficulty visiting her in hospital.

Other reasons for men's 'distress' ('a little bit' or 'moderately' bothered on MGMQ Q2), despite not wishing to talk with a health professional, were related to: pressures of work; concern for his

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partner's health; concern for his partner who is at home alone; needing to do many more things at home due to his partner's poor health; lack of sleep due to the impending birth; health problems with their relatives.

As with the women, however, it is noteworthy that one of these two men that 'Possibly' wanted to talk with a health professional (MGMQ Q4) said that he felt distressed just 'a little bit' (Q2). Therefore, despite this much smaller sample size in men, it is also possible that the level of bother, and the (possible) wish to talk with a health professional, may not be strongly related. In addition, all six men who said that they were bothered 'Moderately' (none said 'a lot'), which is thus also screen positive on the MGMQ, said that they did not want to talk with a health professional.

3.7. Comparison of the Two Instruments: Women

Rates of screening positive on the two measures were similar for the women (c. 35% - see Table 3). However, the concordance for screen positive between the two instruments was only 'average', with about a third of the women screening positive on one instrument then screening negative on the other instrument (see Table 4).

Two of the 17 women (c. 12%) who said on the MGMQ that that they wanted to speak with a health professional (responding 'Yes' to Q4) were negative on the W-G, and 15 of the 37 (41%) who said that they 'Possibly' wanted to talk with a health professional were also negative on the W-G. Thus 17 of the 54 women (31%) who either said 'Yes' or 'Possibly' I want to speak with a health professional on the MGMQ Q4 were 'missed' (negative) by the W-G.

Of the 28 women who were positive on the W-G but were negative (and thus 'missed) by the MGMQ, all therefore had said on the MGMQ that they did not wish to talk with a health professional, and also that they did not consider their distress to be at the level of 'Moderately' or 'a lot'.

Table 4. Screen positive concordance between the Whooley/GAD-2 and the MGMQ.

	Women (N= 227-228)	**Men* (N= 53-55)**
Positive on W-G[1]	MGMQ detected 53 of the 81 women (65%) positive on the W-G	MGMQ detected 7 of the 11 men (64%*) positive on the W-G
Positive on the MGMQ[2]	The W-G detected 53 of the 77 women (69%) positive on the MGMQ	The W-G detected 7 of the 8 men (69%*)

Note: 'Detected' means' 'were positive on'. * Interpret these results with caution, due to the small sample size. [1] Positive on either, or both, of the Whooley or GAD-2. [2] Positive on the Minor or Moderate/Major distress classification (see text and Table 3).

3.8. Comparison of the Two Instruments: Men

The rates of screen-positive for men between the two instruments were similar (15-20%; see Table 3). Table 4 shows that of the eight men positive on the MGMQ, only one was negative on the W-G. This man was 'Moderately' bothered by how he was feeling, saying on Q3: "the fact that my wife isn't well", though also stating that he did not want to talk with a health professional.

Of the 11 men positive on the W-G, seven were positive on the MGMQ, but four were negative. For these four men, while on the Whooley they said 'Yes' to at least one of the two questions (n=3), or had a score of 3 or more on the GAD (n= 1), on the MGMQ Q1 they either said that they were not distressed at all (n=1), or on Q2 said that they were only bothered a 'little bit', and did not want to talk with a health professional (n=3). Reasons the three men gave for feeling just a little bit bothered, and not wanting to talk to a health professional, were: "my partner is home alone"; "too little sleep and the approaching birth"; "our other child cannot see his mother as she's in hospital".

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4. Discussion

The results of the study highlight that the percentage screening positive on emotional measures for hospitalized women are higher than in community samples, as would be expected, given that the pregnant women had been admitted to hospital with health complications, and as shown by Toscano et al. [12]. In agreement with the literature this result confirms the distress burden exerted by the condition of greater risk of hospitalized women, especially in cases of risk of preterm birth, and reiterates the importance of screening for perinatal distress in hospital settings [15]. Findings from the current study also suggests that partners of hospitalized women may suffer clinically relevant distress.

Both the W-G and the MGMQ were considered acceptable by the Italian-speaking women in this sample. A greater proportion of women preferred the MGMQ over the

W-G (50% vs 37%: small-to-medium effect size), with a large majority preferring the inclusion of the 'Possibly' response option in both MGMQ Questions, Q1 (67% vs 32%) and Q4 (71% vs 29%), these differences being large effect sizes and thus clinically meaningful. Of note is that the Whooley does not provide this response option, only those of 'Yes' and 'No'.

Regarding the understanding of the Anhedonia Question, as has been found in previous research [24,25], a sizeable proportion of women (half) endorsing the anhedonia symptom on the Whooley said it was only related to the normal physical changes of being pregnant, and was not due to their mood or worries. Furthermore a few completely misinterpreted the Whooley Anhedonia Question (n = 4). This percentage is much smaller than found in the English-speaking study [24], and would suggest that the Italian wording for a loss of interest and pleasure is not ambiguous, but that the misinterpretation might be due to the skim reading phenomenon, as suggested by Matthey et al. [24]. Of note is that Bruney and Zhang [43] also reported that around 10% of their screen-positive Patient Health Questionnaire-2 (PHQ-2) sample, who were interviewed, had completely misinterpreted one or other PHQ-2 question (which are the same as the Whooley questions). Thus, it seems to clearly emerge from these data, that, without explicitly exploring their comprehension of the Anhedonia Question, the use of the Whooley as a screening measure in Italian women seems to be as problematic as it is in English-speaking women.

Regarding the concordance between the two instruments W-G and the MGMQ, the results of the study show that while screen positive rates on both measures were similar (both for women, and also for men), around a third of the women who screened positive on one measure screened negative on the other. This means that by using one measure or another some women will be missed (will screen negative); one may wonder what this means in different cases, and whether this screen positive concordance percentage is acceptable. Even if this result replicates the finding from previous research using other perinatal mental screening measures [27], this lack of screen positive concordance between measures should be a major concern for researchers and clinicians in this field.

An important point in the comparison between the two instruments concerned the desire of women to talk to a professional about their emotional difficulties (Q4 MGMQ). The data show that 17 women (31%) who said they would like, or would possibly like, to talk to a professional screened negative on the W-G. This means that in a service using just W-G, these women's wishes would not have been identified.

We would argue that asking a woman directly how distressed she feels, and whether or not she wishes to talk with a health professional, should take priority over a numerical score based upon the frequency of symptoms, where the assumption is that a certain level of frequency warrants intervention. To say, for example, that a woman who says that she wants to talk with a health professional should not receive any such service because she only scored 2 on the GAD-2, or because she said 'No' to both Whooley questions, seems to be lacking the human element of listening to what the woman is really experiencing. While guidelines often state that further clinical judgement should always be used to determine if further assessment is required [44], rather than just rely on a woman's 'score' or responses to such screening questions, the reality is that few services have the time or resources to provide skilled in-depth questioning to every woman who is screened. The MGMQ

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minimizes the risk of missing women who do indeed have a substantial level of distress, or who wish to talk with a health professional, regardless of the frequency of specific symptoms they are experiencing. This may be especially important in the inpatient hospital setting, as there are not always routine scheduled visits as there are in outpatient perinatal services. A tool that immediately provides clinically relevant information is therefore very useful to open a conversation and possibly propose a referral.

The situation appears to be slightly different for men, but the small sample size means the data should be treated with caution. However, one man who screened negative on W-G was 'moderately' bothered on MGMQ's Bother Impact question, though the two men who said that they 'Possibly' wanted to speak with a health professional, were also positive on W-G.

Another interesting aspect concerns the reasons that women reported for their distress. In line with other Italian studies, they were similar to the typical concerns of motherhood but with greater emphasis on fears for the pregnancy outcome, the health of the woman and the child, and the distress due the woman's absence from home [15]. The reasons given by men are very similar and emphasize concerns about the health of their partner and the fetus, and the difficulty in managing work and household matters in the absence of the woman. In the current study, carried out in an obstetric hospital department where screening has been implemented for several years [17–19], the use of the MGMQ's brief questions enabled the clinicians (and researchers) to understand some important clinical issues, and provided an opening for the clinician to talk to the woman about how she was feeling. This represented a very useful information for planning the referral to the Obstetric Unit's Psychologist.

The data also show that men (even if they agreed to participate in a small percentage) have shown willingness to fill out the MGMQ questions, and even the one about wishing to talk with a health professional. This confirms a previous finding when using the MGMQ with men in Italy [40] and other studies in which the extension of perinatal distress screening to men was found to be desirable [45] and welcomed [46].

4.1. Limitations of the Study

A limitation of the study was the low uptake rate, and thus small sample size, of the men. Therefore, for the male sample the results should be taken with caution. Another limitation could be the recruitment only on working days and the composition of the women's sample (as women were mostly Italian, partnered, highly educated and in the third trimester of gestation). Future research may explore the clinical usefulness of these screening tools in larger, more heterogeneous samples.

5. Conclusions

This study, conducted in a hospital clinical setting, shows the importance of performing an accurate screening of emotional distress in perinatal women who experience hospitalization. It also shows that screening their partners, when possible, can be important too. However, it highlights some aspects related to the performance of screening tools that deserve attention. The results shows that there are differences between the screening symptom questionnaires of the Whooley questions and GAD-2, and the construct questionnaire of the MGMQ. This latter measure appears to have the advantage of asking women directly how they feel, why they might be feeling this way, and whether they would like to talk with a health professional. Furthermore, many of the women, and some of the men, who were 'screen positive' on the MGMQ and who said that they wished to, or possibly wished to, talk with a health professional were missed when screening by using the Whooley questions along with the GAD-2. Thus, results of this study may help clinicians to be aware of the respective merits and possible weaknesses of different screening tools, to enable them to select a suitable instrument for their clinical practice.

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Abbreviations

The following abbreviations are used in this manuscript:

ASST	Azienda Socio Sanitaria Territoriale
DSM	Diagnostic and Statistical Manual of Mental Disorders
GAD-2	Generalized Anxiety Disorders-2
MGMQ	Matthey Generic Mood Questionnaire
NICE	National Institute for Health and Care Excellence
PHQ-2	Patient Health Questionnaire-2
PO	Project Officer
Q1 MGMQ	Question 1 of MGMQ, Distress Question
Q2 MGMQ	Question 2 of MGMQ, Impact Question (bother)
Q3 MGMQ	Question 3 of MGMQ, Reason Question
Q4 MGMQ	Question 4 of MGMQ, Wish-to-Talk Question
UK	United Kingdom
W-G	Whooley questions used together with the GAD-2

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