



Research report

Male depression in females?

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ABSTRACT

Background: Scientific evidence for a male-typed depression (“male depression”) is still limited, but mainly supports this concept with respect to single externalizing symptoms or symptom clusters. In particular, studies on non-clinical populations including males and females are lacking. The present study aims at assessing general well-being, the risk and the symptoms of male depression dependent on biological sex and gender-role orientation on instrumental (masculine) and expressive (feminine) personality traits in an unselected community sample of males and females.

Methods: Students (518 males, 500 females) of the Ludwig-Maximilians-University of Munich, Germany, were asked to participate in a “stress study” and complete the following self-report questionnaires: the WHO-5 Well-being Index [Bech, P., 1998. Quality of Life in the Psychiatric Patient. Mosby-Wolfe, London], the Gotland Scale for Male Depression [Walinder, J., Rutz, W., 2001. Male depression and suicide. International Clinical Psychopharmacology 16 (suppl 2), 21–24] and the German Extended Personal Attribute Questionnaire [Runge, T.E., Frey, D., Gollwitzer, P.M., et al., 1981. Masculine (instrumental) and feminine (expressive) traits. A comparison between students in the United States and West Germany. Journal of Cross-Cultural Psychology 12, 142–162].

Results: General well-being of the students was significantly lower compared to population norms. Contrary to expectations, female students had a greater risk of male depression than male students (28.9% vs. 22.4%; $p < 0.05$). Overall, prototypic depressive symptoms as well as externalizing symptoms were more pronounced in females. In the subgroup of those at risk for male depression, biological sex and kind of symptoms were unrelated. Principal component analyses revealed a similar symptom structure for males and females. Low scores on masculinity/instrumentality significantly predicted higher risk of male depression, independent of biological sex.

Limitations: The study sample is not representative to the general population. Self-reports of the participants were not validated by a clinical evaluation.

Conclusions: The results suggest that male depression might also be highly prevalent in females, at least in university students. This can be explained by a growing social acceptance of aggression in women, by a greater exposure to chronic stressors and by a more pronounced stress sensitivity. Particularly female students need special attention and support. Externalizing symptoms should be routinely assessed when diagnosing depression in men and women.

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1. Introduction

The sex gap in rates of major depression is well known, but rarely understood to date.

One of the proposed explanations is the concept of “male” (also: “male-typed” or “masculine”) depression assuming that men present a different depressive symptomatology

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including externalizing behaviours which are typical for traditional masculinity but are not included in common depression diagnosis (Rutz et al., 1995; Walinder and Rutz, 2001; Cochran and Rabinowitz, 2000; Real, 1998; Pollack, 1998; Potts et al., 1991). Thus, a gender bias in depression diagnosis could contribute to low depression rates in men.

Besides clinical evidence of male depression in psychotherapy and psychopharmacotherapy with depressed men, scientific evidence available so far mainly do support this concept with regard to single symptoms as well as to externalizing symptom clusters in clinical samples and community surveys (Katz et al., 1993; Fava et al., 1995; Zierau et al., 2002; Winkler et al., 2004, 2005; Bech, 2001; Möller-Leimkühler et al., 2004; Möller-Leimkühler et al., 2007; Diamond, 2008; Magovcevic and Addis, 2008).

Nevertheless, relevant issues concerning nosological classification and misdiagnosis towards alcohol dependence and personality disorders, or the question whether male depression represents a distinct subtype of depression or a response to prototypic depression, remains unclear.

In general, current psychiatric classification systems may underestimate the role of externalizing symptoms in unipolar depression, although anger, aggressiveness, irritability and hostility frequently occur in unipolar depressed, not only in bipolar patients (Pasquini et al., 2004; Painuly et al., 2005; Biondi et al., 2005). While a lot of attention is paid to depressive mood and anxiety, symptoms like anger, hostility and irritable mood are neglected, since depression scales are highly selective and represent rather their historical background than individual patterns of experience and symptoms (Demyttenaere and De Fruyt, 2003). Within this discussion, the gender perspective systematically should be more included to better understand experiences of and responses to depression which are probably shaped by gender-related self-concepts and social norms of female and male behaviour (Nolen-Hoeksema et al., 1999).

The sociocultural model of explaining gender differences in personal characteristics assumes that, given the changes in social structure and gender roles (especially in the female role) during the last decades, women have become more masculine, while men have become less masculine (Udry, 2000). With respect to depression, this would probably mean that the presentation of depression during the preclinical stages, where gender differences are supposed to be more pronounced compared to clinical relevant stages, would have become rather similar in men and women due to their converging gender-role orientation. However, this assumption does not comply to the recent findings of Bech (2001) who had pointed out that the pathways to major depression differ for men and women, with women going straight into depression while men passing gradually into depression via stress, aggression and alcohol misuse. On the other hand, community data on male adolescents indicate, though externalizing symptoms were significantly related to risk of male depression, internalizing symptoms reflecting the prototypical female way of experiencing and expressing depression, were also highly prevalent in young males (Möller-Leimkühler et al., 2007).

Studying both, community and clinical populations is equally important to extend our understanding of male depression. However, based on the fact that males are

reluctant to seek help, particularly in the case of depression, clinical populations would represent an *a priori* selected sample excluding those males who did not seek help. In contrast, community studies would allow to capture these males, thus providing information on the prevalence and symptoms of male depression.

2. Aim of study

The present study aims at assessing general well-being, the risk and the symptoms of male depression in an unselected sample of male and female university students with respect to biological sex and gender-role orientation on instrumental (masculine) and expressive (feminine) personality traits.

In order to test the gender specificity of male depression, the following hypotheses were generated:

1. The risk of male depression is higher for males than for females due to higher scores on externalizing symptoms in males.
2. Male depression in females is associated with higher scores on masculinity (instrumentality) and lower scores on femininity (expressiveness).

3. Methods and subjects

3.1. WHO-5 Well-being Index

The WHO-Five Well-being Index (WHO-5) was developed from the WHO-10 Well-Being Index (Bech, 1998; Heun et al., 1999). It is a brief self-rating screening instrument for depression covering the three core items of depression according to ICD-10: mood, interests, and energy. Each of the five items is rated on a 6-point Likert scale from 0 (= not present) to 5 (= constantly present). Within the range from 0 to 25, a raw score <13 suggests poor well-being, and that respondents should be tested for depression (WHO, 1998). Additionally, the raw score is transformed to a percentage score from range 0 (worst thinkable well-being) to 100 (best thinkable well-being). The WHO-5 is a highly sensitive instrument, but its specificity is rather low, so that a relatively high rate of false-positive screenings can be expected (Henkel et al., 2004).

3.2. The Gotland Scale for Male Depression

The Gotland Scale for Male Depression (Rutz et al., 1995; Rutz, 1999; Walinder and Rutz, 2001) is a screening instrument for male depression consisting of 13 items which are rated on a 4-point Likert scale from 0 (= not present) to 3 (= present to a high degree). Originally the scale was developed as an unidimensional construct. Later, Zierau et al. (2002) proposed a splitting into two subscales: the distress subscale (7 items: being stressed, aggressiveness, irritability, feeling of displeasure, overconsumption of alcohol or related substances, behaviour changes, greater tendency to self-pity) and the depression subscale (6 items: being burned out, tiredness, difficulty making decisions, sleep problems, hopelessness, family history of depression or suicide). The total score of the 13 items has a theoretical range from 0 to 39. The standardisation of the total score is: 0–12 = no depression, 13–26 =

probable depression and 27–39 = definite depression. Psychometric properties were acceptable when used in a population with alcohol abuse disorder (Zierau et al., 2002). Möller-Leimkühler et al. (2007) reported an internal consistency (Cronbach's alpha) for the total scale of 0.81, for the distress subscale 0.71, and for the depression subscale 0.65. Both subscales were significantly intercorrelated (Spearman's $Rho = 0.61$; $p = 0.000$), however, they did not comply with underlying empirical factors. Convergent validity of the Gotland Scale was satisfying due to its correlation with the WHO-5 (Spearman's $Rho = -0.56$; $p = 0.000$).

In the present study the psychometric properties were again satisfying: $\alpha = 0.85$ for the total scale, $\alpha = 0.69$ for the depression subscale and $\alpha = 0.76$ for the distress subscale; the correlation between Gotland Scale and WHO-5 was $Rho = -0.66$; $p = 0.000$.

3.3. Gender-role orientation

Gender-role orientation was measured by the German Extended Personal Attributes Questionnaire (GEPAQ), a German version of the original questionnaire of Spence and Helmreich (Runge et al., 1981). It is a self-report instrument consisting of 40 bipolar items (for instance: gives up very easily – does not give up very easily). The items describe socially desirable (+) as well as undesirable (–) characteristics stereotypically believed to differentiate the sexes. They are related to six separate scales, three “positive” scales (M+, F+, MF+) and three “negative” scales (M–, FC–, FVA–). For differentiating the 4 groups of gender identity, only the masculinity (M+) and the femininity scale (F+) are used. The masculinity scale contains instrumental attributes which are socially desirable for both sexes but which males are believed to possess in greater abundance than females (for instance: independence, self-confidence, competitiveness). Conversely, the femininity scale contains items describing expressive attributes which are socially desirable for both sexes, too, but which females are believed to possess in greater abundance than males (for instance: gentleness, helpfulness).

The scale MF+ contains both instrumental and expressive items with different ratings of social desirability depending on the sexes (for instance: doesn't cry easily, feelings not easily hurt). Analyses of all three scales revealed that MF+ items cluster with the M+ items, but for theoretical reasons they have been retained as a separate scale.

The three, negative “scales reflect undesirable attributes. The negative masculinity scale (M–) contains items like, “egoistical”, “cynical”, the two femininity subscales refer on the one hand to verbal passive-aggressiveness (FVA–), on the other hand to excessive selflessness (FC–).

The respondents are asked to rate themselves for each of the bipolar items on a five-point scale. The four-way-classification of gender-role orientation is done by the median-split-method, referring to the median of the masculinity (M+) and the median of the femininity scale (F+). The resulting four types are labeled

- masculine (high in masculinity and low in femininity)
- feminine (low in masculinity and high in femininity)
- androgynous (high in masculinity and high in femininity)
- undifferentiated (low in masculinity and low in femininity).

In the present study, the median of the masculinity scale was 34, and the median of the femininity scale 37. These levels are identical with the medians found in a large community sample of young men (Möller-Leimkühler et al., 2007), whereas particularly the masculinity median is higher compared to the age-adjusted score of a representative German population sample assessed 10 years ago (median masculinity scale = 29, median femininity scale = 36) (TdW Intermedia, 1997). Obviously, an increase in masculinity has occurred during the last decade.

The questionnaire has been validated in student samples, the psychometric qualities are satisfying and factor analyses in different samples of US and German high school and college students confirm the orthogonality of the masculinity and the femininity scale. Spence and Helmreich (1978) found internal consistency reliability coefficients of 0.85 and 0.82 for the two scales. Alpha coefficients from 0.77 to 0.80 are reported for samples of adult men and women (Helmreich et al., 1981).

3.4. Subjects

From October 2003 to October 2004, a total of 1018 (504 males, 491 females) students from different faculties of the Ludwig-Maximilians-University of Munich were enrolled in the study. The study was presented as an investigation focussing on stress experience and subjective well-being in males and females. Participation was voluntary and anonymous. Subsequent to a lecture the students were asked to participate into the study and fill in the above described self-rating instruments. Based on convenience reasons, the students were mainly recruited from the medical and dental medical faculty (52.8% with 43.1% males and 62.7% females), other faculties were included to reach approximately the aspired number of 500 males and 500 females. Completely filled in questionnaires were obtained from 995 participants. The mean age was 24.51 for the males, and 23.66 for the females ($p = 0.002$).

3.5. Data analysis

Depending on the quality of the data, χ^2 - or Student's *t*-test was used for group comparisons, Spearman's non-parametric correlation coefficient Rho resp. Pearson's parametric correlation coefficient r for correlational analyses. Principal component analysis was performed on all Gotland Scale items for the whole sample and separately for males and females at risk for male depression. Given that there were conceptual and clinical reasons to presume a correlation between factors, promax rotation was preferred to orthogonal rotation because it allows for correlation between factors. The number of factors to be extracted was determined according to the scree-plot method. Multivariate ANOVA was performed to calculate the impact of biological sex and gender-role orientation on the risk of male depression. All analyses were run under SPSS 15.0 for Windows.

4. Results

4.1. General well-being and male depression

The level of general well-being of our sample is similar for males and females (Table 1). It is significantly lower

Table 1

Descriptive statistics of the variables assessed by sex (mean, standard deviation).

	Males <i>n</i> = 518	Females <i>n</i> = 500	<i>p</i>	Total
WHO-5 percentage	54.90 (20.36)	55.44 (20.67)	n.s.	54.90 (20.36)
Gotland Scale total score	8.27 (6.32)	9.64 (6.72)	0.001	8.94 (6.55)
Gotland Scale total score ≥ 13	18.01 (4.40)	18.11 (4.90)	n.s.	
GEPAQ positive masculinity	34.67 (5.80)	32.28 (6.03)	0.000	33.49 (6.03)
GEPAQ positive femininity	35.48 (5.16)	37.82 (5.20)	0.000	36.64 (5.34)
GEPAQ negative masculinity	24.67 (10.96)	22.25 (8.82)	0.000	23.28 (10.04)
GEPAQ negative femininity	19.19 (4.73)	21.44 (5.27)	0.000	20.31 (5.139)

compared to German population norms, which are 77.00 (13.67) for men <40 years and 74.47 (13.92) for women <40 years ($p = 0.001$) (Brähler et al., 2007).

Screened with the Gotland Scale of Male Depression, prototypic depressive and externalizing symptoms turned out to be rather prevalent among males as well as females (scores > 1). Every symptom assessed was reported more often by the female than male students except burned out (empty) and overconsumption of alcohol and related substances. Significant differences in symptom prevalence resulted in feelings of stress, aggressiveness, irritability, sleep problems, disquiet especially in the morning and self-pity (Table 2).

25.6% of the students showed a risk of male depression with females being considerably more affected than males (28.9% vs. 22.4%; $p = 0.024$), while the total scores did not differ among the sexes within the risk group (Table 1). The mean sum scores of the symptoms indicate, that the higher risk of male depression in females is not due to higher scores in prototypic symptoms, but to externalizing symptoms which tend to be more pronounced in females, especially subjective stress and aggressiveness. Unlike in the non-depressed subgroup, differences in symptoms do not reach significance in the risk subgroup. There is only one symptom which is significantly more pronounced the males compared to the females: hopelessness (Fig. 1).

Table 2

Prevalence of symptoms by sex, % (Gotland Scale for Male Depression, scores > 1).

Gotland Scale symptoms	Males	Females	<i>p</i>
More stressed than usual	28.1	37.6	0.000
More aggressive	13.3	24.4	0.000
Empty	28.0	22.7	n.s.
Constantly tired	27.4	33.2	n.s.
More irritable	17.6	21.3	0.045
Difficulty making everyday decisions	9.8	11.0	n.s.
Sleep problems	20.7	34.4	0.032
Especially in morning disquiet	6.7	11.2	0.012
Overconsumption of alcohol/excessive activity	16.8	14.6	n.s.
Change of behaviour	4.9	6.8	n.s.
Hopelessness	10.4	9.6	n.s.
Self-pity	8.3	10.0	0.006
Positive family history of abuse/depression/suicide	11.8	10.2	n.s.

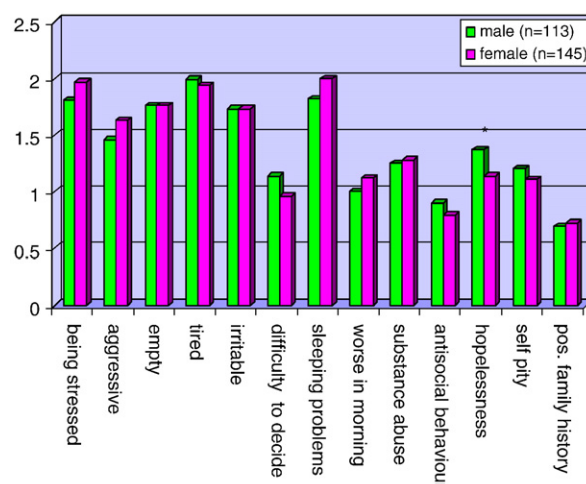


Fig. 1. Symptom mean scores of male and female students at risk of male depression (Gotland Scale for Male Depression, total score ≥ 13).

Principal component analysis on the Gotland Scale symptoms was conducted for the whole sample and separately for the male and female risk group. For the whole sample, two factors resulted with an Eigenvalue ≥ 1 explaining 46.48% of the variance in response to individual symptoms. Both factors were “mixed” ones, including externalizing as well as prototypic depressive symptoms. The dominant first factor included 9 items and explained already 37.79% of the variance. These results are in line with

Table 3

Factor loadings of the 13 items of the Gotland Scale for Male Depression in males and females at risk of male depression (“male” symptoms are printed in bold).

	Males		Females
Factor 1	Empty	0.751	Stressed 0.708
	Stressed	0.722	Aggressive 0.671
	Irritable	0.684	Irritable 0.657
	Aggressive	0.568	Pos. family history −0.456
	Worse in morning	0.308	Tired 0.375
Explained variance, %	18.14		20.49
Eigenvalue	2.36		2.67
Factor 2	Self-pity	0.703	Behaviour changes 0.755
	Hopelessness	0.666	Self-pity 0.653
	Behaviour changes	0.609	Hopelessness 0.574
	Difficulty to decide	0.460	Empty 0.508
			Alcohol 0.353
Explained variance, %	12.13		11.86
Eigenvalue	1.58		1.54
Factor 3	Pos. family history	0.767	Sleep problems 0.739
	Alcohol	0.646	Worse in morning 0.621
	Sleep problems	0.465	Difficulty to decide 0.465
	Tired	−0.326	
Explained variance, %	10.80		10.18
Eigenvalue	1.40		1.13

the factor structure found in Möller-Leimkühler et al. (2007) on a large homogenous male sample.

For the males at risk of male depression, the initial analysis yielded a 5-factor solution and accounted for 59% of the variance. According to the scree-plot, a 3-factor solution was assumed the best approximation with each factor explaining at least 10% of the variance. The same selection was made for the analysis of the female risk group, which initially yielded 4 factors explaining 51% of the variance. Factor loadings are demonstrated in Table 3.

The factor structure is rather similar for males and females at risk of male depression. What becomes obvious is that the symptom cluster of stress, aggressiveness and irritability is highly important in explaining the individual symptomatology in both sexes. Thus, the first hypothesis, that male students have a higher risk of male depression due to their higher scores on externalizing symptoms is not supported by the data.

4.2. Gender-role orientation and male depression

According to the median-split method, the four types of gender-role orientation differed significantly in both sexes ($\chi^2 = 65.49$, $df = 3$; $p = 0.000$). 22.2% of the male students were androgynous, 29.9% masculine, 14.7% feminine and 30.7% undifferentiated. A similar proportion of 21.4% of the female students were classified as androgynous, 16.0% as masculine, 35.4% as feminine and 26.9% as undifferentiated. Obviously, the traditional sex-typed self-concepts are preferred by males and females, followed by an untraditional self-concept with low scores on instrumental and expressive traits being even more prevalent in males. Multivariate ANOVA indicates that biological sex and gender-role orientation had independent effects on the risk of male depression without any interacting effects (sex: $F = 7.28$; $p = 0.007$ – gender-role orientation: $F = 26.96$; $p = 0.000$).

Risk of male depression assessed by the total score of the Gotland Scale is significantly associated with levels of different aspects of masculinity and femininity (Tables 4 and 1). Most important is positive masculinity (instrumentality) being inversely correlated to depression scores, and negative femininity being positively correlated. The impact of negative femininity is mostly due to the component of verbal aggression.

Seen from a categorial point of view, students with low levels of positive masculinity performing a feminine or undifferentiated gender-role orientation have the highest risk of male depression. Among the females at risk for male depression, most have been classified as feminine (38.2%) and undifferentiated (36.1%); among the males at risk, every second has been classified as undifferentiated (52.3%) (Fig. 2).

Table 4

Correlations between GEPAQ masculinity and femininity scales and the Gotland Scale of Male Depression (Pearson's r).

GEPAQ scales	Gotland total score	p
Masculinity (M+)	−0.37	0.000
Femininity (F+)	−0.12	0.026
Negative masculinity (M−)	0.09	0.000
Negative femininity (F−)	0.45	0.000
– Community (FC−)	0.27	0.000
– Verbal aggression (FVA−)	0.44	0.000

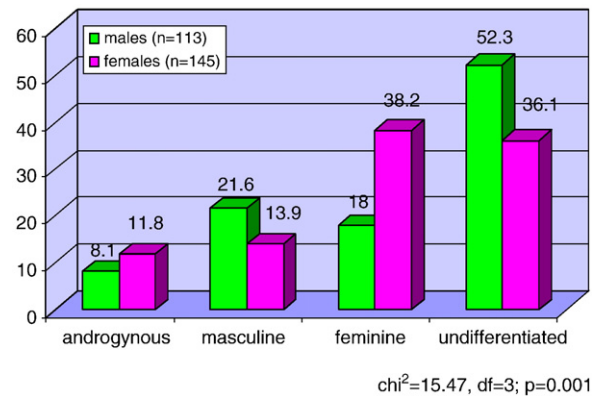


Fig. 2. Gender-role orientation by sex in students at risk of male depression ($n = 258$), %.

High negative femininity is associated with low scores on positive masculinity ($r = -0.59$; $p = 0.000$), resp. with an undifferentiated gender-role orientation, particular in the male students. Apart from this, and interestingly, the correlation of negative femininity and risk of male depression is stronger in males than in females ($r = 0.49$; $p = 0.000$ vs. $r = 0.39$; $p = 0.000$).

In sum, the present data do not confirm the second hypothesis, that female students being at risk of male depression would perform a masculine gender-role orientation. The opposite is true: risk of male depression is low in females with dominating masculine traits, but high in females with low levels of masculinity.

5. Discussion

General well-being, risk and symptoms of male depression, and gender-role orientation were investigated in a sample of 518 male and 500 female university students to test the gender specificity of male depression and the influence of gender-role orientation.

Male and female students reported a similar level of well-being which was significantly reduced compared to age-adjusted population norms (Brähler et al., 2007). This is consistent with a number of international studies of different student populations suggesting a worrying picture with high levels of mental distress and psychological morbidity. Already 10 years ago, Webb et al. (1996) found in a sample of 3075 second year students across 10 UK universities that 33% of the male and 35% of the female students reported moderate and severe anxiety compared to 13% of the general population. In general, studying at a university has become more stressful in the recent 3 decades with new challenges such as increasing time pressure, requirements of practical trainings, expectations of staying abroad and learning foreign languages – these demands are nowadays basic conditions to get a job.

The risk of male depression as assessed by the total score of the Gotland Scale of Male Depression was significantly higher in females than in males (29% vs. 22%; $p < 0.05$), not confirming the first hypothesis, that male depression would be more prevalent in males. However, reduced well-being and high risk of (male) depression are in line with previous international studies indicating that distress and depression

are high in college students, especially in medical and female students (Dahlim et al., 2005; Dyrbyrne et al., 2006; Tjia et al., 2005; Wong et al., 2005). The reasons for this may be high challenges in the context of examinations, worries about the future, maladaptive stress responses, and with respect to gender differences more feelings of guilt because of responsibility or higher scores of neuroticism in females.

According to the National Mental Health Association, suicide is the second leading cause of death among college students, and the overall suicide rates are higher than in the age-matched population. This increased rate of suicide is driven largely by higher rates among women: female medical students commit suicide at the same rate as male medical students (Pepitone-Arreola-Rockwell et al., 1981) whereas in the United States in general, suicide rates are much higher among men. Regarding the possible link between suicidal behaviour and male depression new data from Hungary (Rihmer et al., 2009) suggest a pronounced association in depressive suicide victims and suicide attempters. Among suicide victims the rate of male depression was significantly lower in females than in males (83% vs. 100%; $p=0.02$), however, among suicide attempters the rate did not differ between the sexes (94% and 91%). In conclusion, aggressive symptoms obviously play an important role in the development of depression and suicidal behaviour, that have been largely ignored in women. Especially female medical students are a high-risk group.

It has been argued that the specific vulnerability of female students has to be understood in the context of changing gender roles, and gender-related self-concepts concerning instrumentality and expressiveness should be considered. The data of the present study reveal a significant association between instrumentality and risk of male depression for males and females – independent of biological sex – indicating that low instrumentality (masculinity), resp. feminine and undifferentiated self-concepts, predict high scores of male depression. In undifferentiated males the risk of male depression was 52.3%, in undifferentiated females the risk was 36.1%, and in feminine females it was 38.2%. Similar results have been found for prototypic depressive symptoms (Whiteley, 1983; Upmanyu and Upmanyu, 1995; Napholz, 1994). However, with respect to externalizing symptoms being commonly more prevalent in males, it was unexpected, that these symptoms were significantly more pronounced in female students with low masculinity scores. It was rather expected that, if females would be at risk of male depression, they would have a masculine gender-role orientation. This result seems difficult to interpret. What is plausible is that female students with a traditional feminine or undifferentiated orientation significantly report more subjective stress (83.5%) compared to females with an androgynous and masculine orientation (75.4%) or to males with low scores of masculinity (74.1%) ($p<0.05$). However, what needs explication is, why females with low scores on masculinity were significantly more aggressive (60.6%) compared to females with an androgynous and masculine orientation (57.8%) or to males with low scores of masculinity (52.6%) ($p<0.05$).

There are at least two different possible explanations which do not exclude each other:

1. The Gotland Scale of Male Depression measures aggressiveness in a very global way not differentiating between the experience and the expression of aggression. As a number of studies suggest, the potential for aggression is equal for both sexes but the expression of aggression differs due to socialization and gender norms (Thomas, 2005). Whereas males are socially allowed to express their aggression more overtly and physically as signs of power and dominance, females suppress their aggression or tend to more passive and verbal forms of expressing their aggressive feelings not to be stigmatized as losing self-control (Brescoll and Ullmann, 2008). As the present data have shown, the negative femininity scale of the GEPAQ was significantly related to risk of male depression for both sexes, mainly due to verbal passive-aggressiveness like nagging, complaining, fussing, or whining. This is consistent with previous findings on negative femininity being linked to depression (Stewart and Malloy, 1989) and overall psychological distress (Hegelson, 1994). However, due to the global assessment of aggression by the Gotland Scale for Male Depression, qualitative differences in aggression cannot be differentiated among the respondents.
2. Apart from this, the discrepancy between low levels of masculinity and high levels of externalizing symptoms in women seems untypical because women are commonly believed to prefer internalizing coping styles, e.g. rumination (Nolen-Hoeksema et al., 1999) which has been linked to depression. This is particularly true for women who adapt to traditional femininity. In the face of changing gender roles and numerous challenges due to multiple roles in women, low instrumentality is a barrier to effective coping and represents an additional internal stressor which may result in helplessness. As gender-related traits are in a process of being conversely valued, in which the male stereotype is more negatively valued compared to the female stereotype (Glick et al., 2004; Hosoda and Stone, 2000), young females may respond to helplessness not only with normative prototypic symptoms of depression, but also with more aggressive behaviour, since aggression is becoming more socially tolerated in females than in males, even physical aggression (Straus, 1997). Thus, young women may feel free to be more expressive than men with respect to aggression. In fact, a general increase of aggression in girls and young women has been described (Moretti et al., 2005). At the same time there is some evidence, that females have remained rather feminine in their self-concept instead of getting more masculine (Lueptow, 2005). The results of the present study go into the same direction. Thus, a feminine self-concept or low masculinity may be combined with more expressed aggression and male-typed behavioural patterns, also resulting for instance in increasing rates of alcohol dependence (Möller-Leimkühler et al., 2002) or smoking (Pampel, 2003). Interestingly, the results related to gender differences in the prevalence of anger attacks in depressed patients have been inconsistent. Considering the above mentioned change in valuating gender traits, anger attacks in women can be understood as signs of chronic overburden and probably chronically suppressed negative feelings. Traditional femininity may hinder effective coping rather causing additional burden due to its negative consequences such as somatic complaints, distress, anxiety, depressiveness and emotion-focused coping strategies (Möller-Leimkühler et al., 2002).

Generally, increasing masculine patterns in women's behaviour might not only be due to a growing social acceptance, but also to gender-related chronic stressors and a specific stress vulnerability. More than men, women have been increasingly exposed to chronic stressors in the last decades because of their entrance into the labour market, multiple burden due to housekeeping and child care, change of family structures (increasing number of single mothers), caregiving for old and disabled family members, and poverty, loneliness and multimorbidity in old age. Recent neurobiological findings suggest that women seem to be more sensitive to chronic stress than men (Goel, Bale, 2009) which may result in a permanent overactivation of the stress hormone axis (hypothalamus–pituitary–adrenal axis), a key factor in stress related disorders like anxiety and depression. The fact that women respond to stress by increasing activity in brain regions involved with emotions and that these changes last longer than in men (Seeman, 1997), may partly explain their vulnerability for affective disorders – and their greater emotional expressiveness, also including feelings of anger and anger-related aggression. It can be assumed that anger and aggression inducing situations as well as coping with these feelings differ for men and women because of biological and sociocultural reasons, which possibly result for women in a prolongation of stress experience.

Finally, the question arises: what do the findings of the present study mean to the concept of male depression? Basically they mean, that male depression can be also prevalent in females, at least in university students. Of course, they are not representative for the general population and further studies are necessary. Whether male depression in women is related to younger age groups should also be analyzed by further research.

Similar to a converging trend towards undifferentiated self-concepts in both sexes (apart from high proportions of traditional male and female self-concepts), the present data suggest that pathways to depression in (young) males and females may be also converging. However, it has to be considered that externalizing symptoms may have a gender specific meaning.

There are several methodological limitations of this study. As stated above, the study sample is not representative due to its homogeneity and selectivity concerning age and education. Data are solely based on self-report measures not allowing to validate the self-rated symptomatology by a clinical evaluation. In addition, as no traditional depression scale was used in this study, rates of male depression could not be compared to depression rates assessed by a common depression scale in order to prove the superiority of the Gotland Scale of Male Depression. As the study is cross-sectionally designed, the causal relationship between male depression and gender-role orientation remains unclear. On the one hand, gender-role orientation may represent a risk factor for developing depression, on the other hand depressive symptoms may have an impact on personality traits leading to a reduction of instrumental qualities.

6. Conclusions

In spite of these limitations, the present data give support to the significance of externalizing “male” symptoms which are reported simultaneously with prototypic depressive

symptoms by males and females. Further research on “male depression” is needed with regard to

- other age groups and populations,
- longitudinal analyses related to a possible change from female- to male-typed psychopathology and vice versa,
- qualitative differences of aggression in depressed males and females,
- the association between male depression and further aspects of gender such as adherence to norms of masculinity and femininity in males and females,
- qualitative studies focussing on the subjective experience and expression of symptoms in depression in males and females with respect to gender issues,
- the question whether externalizing symptoms are a component of depression or a way of coping with prototypic depressive symptoms; and
- the question whether male depression is rather linked to bipolar than to unipolar depression.

Apart from these future directions of research probably being promising, the topic “male depression” should be linked to the general discussion of the role of externalizing symptoms such as anger, aggressiveness and irritability in unipolar depression in order to implement the gender perspective and to take these symptom clusters more strongly into account. This has been largely ignored.

Clinicians should routinely screen for externalizing symptoms in depression, not only in males, but also in females to improve the detection of depression beyond traditional diagnosing. Obviously, university students, especially female medical students need special attention and support, because they represent a neglected high-risk group for depression and suicide.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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