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# Physical Violence During Pregnancy and Associated Factors of Mental Distress Among Women in Yangon Region, Myanmar: A Secondary Analysis of a Cross-Sectional Study

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## Abstract:

**Objective:** Violence against women during pregnancy is a critical human rights issue and a significant global public health concern. The study aimed to assess the prevalence of physical violence during any pregnancies and mental distress by ever-pregnant women, investigate the association between physical violence and mental distress, and explore additional factors linked to mental distress.

**Material and Methods:** This secondary analysis of household-based cross-sectional study included 1,045 ever-pregnant women aged 18-49 years from Yangon Region, Myanmar, interviewed between October and November 2016. Physical violence and mental distress were assessed utilizing the standardized Demography and Health Survey questionnaire and the Hopkins Symptom Checklist-10, respectively. Multiple logistic regression analysis was used for association between physical violence and mental distress.

**Results:** We found that 6.4% (95% CI 5.1% to 8.1%) of the women had experienced physical violence during pregnancy and 34.1% (95% CI 31.3% to 37.0%) had suffered mental distress. We identified no significant association between physical violence during pregnancy and mental distress. Women residing in an urban area, having more than three children, experiencing family debt, having poor health status, having a partner with controlling behavior, and having a partner who consumed alcohol were significantly associated with mental distress.

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**Conclusion:** One in 16 women in Yangon, Myanmar, had experienced physical violence during a pregnancy, while approximately one-third of the women had suffered from mental distress. It is a problem of serious concern in many countries to screen pregnant women for risk factors associated with mental distress during their antenatal care and prepare the appropriate mental health services for them.

**Keywords**: mental health, Myanmar, physical violence, pregnancy

## Introduction

Violence against women (VAW) is driven by gender inequality, and countries across the globe have made a commitment to the the Sustainable Development Goals to eliminate VAW[1]. A pregnant woman is vulnerable as the target of violence which can refer to physical, sexual or emotional violence by a current or former partner or anyone, and which often starts during pregnancy[2,3]. Physical violence, including beating, burning, kicking, punching, biting, maiming or killing, often with the use of objects or weapons, is common during pregnancy[3]. Recent studies have revealed varying rates of physical violence during pregnancy by intimate partners across different countries. The global prevalence was found to be 9.3%[4], with rates of 7.4% in Thailand[5], 25% in Indonesia[6], 3.5% in Vietnam[7], and 12.9% in Malaysia[8].

Physical violence does not only affect physical health but also mental health[3]. The consequences of physical violence on mental health during pregnancy may be of particular importance because it affects not only the woman, but the unborn child and any other children in the family[3,9]. The most common presentation of mental health problems due to physical violence is mental distress[10], which is a state of health experienced by individuals with mental health problems, and it includes symptoms of anxiety and depression[11]. According to a systematic review and meta-analysis study conducted in low- and middle-income countries (LMICs), the prevalence rates of depression and anxiety during pregnancy were estimated to be 25.5%[12] and 13.1%[13], respectively. Another literature review focusing on Southeast Asian countries reported a wide range of prevalence rates for depression during pregnancy, ranging from 4.9% to 46.8%[14].

Numerous studies have consistently demonstrated that women who experience physical violence during pregnancy are at a significantly higher risk of developing mental distress compared to those who are not exposed to such violence[9,10,15]. Some studies suggest that the association between physical violence during pregnancy and mental distress may vary depending on the severity of the violence[16,17]. Other studies have documented that mental distress among pregnant women can be influenced by a range of risk factors which encompass various domains, including traumatic life events, chronic physical health conditions, substance abuse, lack of social support, and socioeconomic factors[15,18–20].

Physical violence during pregnancy in Myanmar is influenced by various cultural, social, and economic factors of which traditional male-dominated norms may reinforce their control of their partners, which can lead to physical violence[21]. Pregnant women are a vulnerable population who need special care during their pregnancy period, not only for physical health but also for mental health. However, mental health problems are not routinely screened for pregnant women in antenatal care visits in most LMICS like Myanmar. Understanding the magnitude of physical violence

and mental health among pregnant women in Myanmar will be useful for providing evidence-based information on the need for mental health services. The objectives of this secondary analysis of a cross-sectional study were to estimate the prevalence of physical violence during any pregnancies and mental distress among 18-49-year-old ever-pregnant women in Yangon, Myanmar, investigate the association between physical violence and mental distress, and explore additional factors linked to mental distress.

## Material and Methods

### Study design, setting and sample

This secondary analysis used the data from a household-based cross-sectional study entitled "Domestic violence and mental health in the Myanmar population" among men and women aged 18-49 years conducted from October to November 2016 in the northern and southern districts of the Yangon Region of Myanmar using a multistage sampling procedure[22]. In the northern district, there were 125 wards (urban subunits of a township) and 235 villages (rural subunits of a township), while the southern district had 110 wards and 375 villages. A total of 16 wards and 16 villages were selected for this original study. The sample size of the original study was calculated to estimate the prevalence of domestic violence among married women (21%), as reported by the Myanmar Demographic and Health Survey (MDHS, 2015-2016), resulting in a total of 2,400 men and women being included in the study[23].

For this current analysis, ever-pregnant women aged 18-49 years from the original study were included, leading to 1,045 pregnant women living in both urban and rural areas in the northern and southern districts of the Yangon Region of Myanmar. We did not initially calculate the required sample size for the objectives of this secondary analysis. However, the sample of pregnant women analysed was sufficient based on a 3% rate of physical violence during pregnancy among ever-married women from the 2015-2016 MDHS dataset[23] with a statistical power of 97%.

### Study variables

Mental distress was assessed using the Hopkins Symptom Checklist-10 (HSCL-10) questionnaire, which consists of ten items that evaluate symptoms of anxiety and depression experienced over the past seven days[22,24]. Among the ten items, four items are related to anxiety and six items are related to depression. These symptoms include sudden feelings of panic without any apparent reason, sudden feelings of fear or anxiety, dizziness or faintness, feelings of tension or being harassed, excessive self-criticism, sleeplessness, feelings of depression or dejection, a sense of worthlessness or insignificance, perceiving everything as burdensome, and a feeling of hopelessness for the future. Participants respond to these questions on a four-point scale, ranging from 1 (not at all) to 4 (extremely). The HSCL-10 questionnaire is widely recognized internationally and serves as a widely used screening tool for assessing symptoms related to anxiety and depression[24]. The cut-off point for mental distress among pregnant women is set at a lower threshold due to their increased vulnerability to developing mental health issues compared to the general population. Therefore, we used an average score ≥1.6 as the cut-off score for suffering from mental distress based on a previous study which measured its validity and reliability[24].

Physical violence during pregnancy was the main exposure of interest and was defined as physical abuse (ever) during pregnancy if any of the following conditions were met: being slapped, hit, beaten, or punched or kicked in the abdomen while pregnant.

Age (in years) of the respondents was categorised into age groups of 18–29, 30–39 and 40–49. Residence was classified into urban or rural areas. For the educational

levels of respondents and partners, we categorised the number of years at school into three separate groups: under and equal to 5 years, 6–11 years and more than 11 years of schooling. The number of children was classified into one child, 2 or 3 children, or four or more children. For family debt status, we classified having debt as "yes" and not having debt as "no".

Self-reported health status was based on the question: 'In general, how would you characterize your current health?' The response options were poor, not very good, good and very good. The variable was dichotomized as 'poor physical health' (poor, not very good) or 'good physical health' (good, very good). Regarding perceived justification of partner violence, the indicators included the following: in your opinion, does a man have a good reason to hit his wife if: she does not complete her household work to his satisfaction, she disobeys him, she refuses to have sexual relations with him, she asks him whether he has other girlfriends. If the respondents answered 'yes' to at least one of the above-mentioned items, it was referred to as perceived justification for partner violence. The responses were categorized as "yes" and "no". If the partner committed at least one of the following acts: preventing the respondent from seeing friends, restricting her contact with family members, insisting on knowing where the respondent is at all times, or becoming angry when the respondent talks with other men, the partner's behaviour was classified as 'controlling'.

### Data collection

In the original cross-sectional study, 12 field data collectors were trained in a two-day workshop by a principal investigator and the research team on the linkages between gender, violence and health, building rapport with respondents, ensuring privacy, and giving hotline information when the respondents required help from the organization. A pilot survey was conducted on 54 households at a township not included in the study areas.

The research team visited the household for the data collection. Before each interview began, the voluntary nature, scope and risks and benefits of the study were explained to the interviewee, and subsequent written informed consent was obtained. The participants were informed of the sensitive content of some of the questions, and informed that they could decline to answer any given question, and that they could withdraw from the study at any time. The interviewee was also informed of the confidentiality of the process. In this study, the women were interviewed only by women. All interviews were conducted using the structured study questionnaires.

### Ethical considerations

The original study was approved by the Norwegian Regional Committee for Medical and Health Research Ethics (2016/1195) and in Myanmar by the University of Public Health and Ministry of Health and Sports. All participants signed an informed consent form. This proposal for a secondary analysis was approved by the Human Ethics Research Committee of the Faculty of Medicine, Prince of Songkla University. The identity of the study participants was encrypted in the data used for analysis.

### Statistical analyses

The data were analysed using R version 4.2.1 (R Foundation for Statistical Computing, Vienna, Austria, 2022). Descriptive statistics were used to analyse means and standard deviations, frequencies, and percents/proportions of all variables. Bivariate associations between mental distress as the outcome variable and other categorical factors as independent variables were analyzed using Chi-square test. The independent variables with p-value<0.2 in the bivariate analyses were employed in the first model

of multivariable logistic regression and then the stepwise backward method was used to identify significant factors using p-value<0.05 in the final model with the Hosmer-Lemeshow test for good model fitness[25].

We constructed a nomogram of significant factors associated with mental distress using the Regression Modelling Strategies (RMS) package of the R program. A bootstrapping approach with 1,000 resamples was performed to internally validate the nomogram. The predicted value of independent variables to mental distress in the fitted logistic regression model was transformed into an individual probability of getting mental distress. We developed a mental distress screening mobile app by utilizing Google AppSheet. The app was specifically designed to operate offline on mobile devices running on the Android operating system.

## Results

A total of 1,045 participants were included in this study. The women's and partner's mean ages were 36±7.6 (S.D.) years and 39±8.5 years, respectively. The cut-off score of 1.6 for mental distress identified 356 women with mental distress, a prevalence of 34.1% (95% CI 31.3% to 37.0%). Table 1 presents the background information of the participating women and their partners. The prevalence of physical violence during pregnancy was 6.4% (95% CI 5.1% to 8.1%). In bivariate analysis, participants with the following traits: aged 40-49 years, urban residence, ≥5 years of schooling, married. having debt, perceived justification of partner violence, and poor self-reported health status were at significantly increased risk of mental distress compared to participants without those traits. Additionally, women whose partners displayed controlling behavior and women whose partners consumed alcohol reported higher risks of mental distress compared with women whose partners lacked these characteristics.

Women who were exposed to physical violence during pregnancy had increased odds of mental distress in bivariate analysis, but the significance disappeared after controlling for covariates in multivariate analysis (adjusted OR 1.35, 95% CI 0.79 to 2.33, p-value=0.274). We found that women who lived in an urban area had a significantly higher risk of mental distress than women who lived in a rural area (adjusted OR 1.68, 95% CI 1.26 to 2.22, p-value<0.001). Having four or more children was associated with the highest risk of mental distress, with an adjusted OR of 2.31 (95% CI 1.51 to 3.52, p-value<0.001), compared to having only one child. Family's debt, poor self-reported health status, a controlling partner, or an alcohol-consuming partner were all associated with a higher risk of mental distress for the woman compared to those who did have these factors (Table 2).

The nomogram illustrates the correlations between the different risk factors and the likelihood of experiencing mental distress, with each risk factor assigned a specific point value (Figure 1). The total points for all variables were calculated, and the corresponding value on the "total points" line was identified. Finally, a straight line was drawn from the total point value to the bottom line, providing the risk assessment for mental distress. Based on the analysis of the nomogram, the risk of mental distress ranged from 0.05 to 0.80, and the area under the receiver operating characteristic curve was determined to be 0.72. The calibration curve for the nomogram had a mean absolute error of 0.012.

The mobile app (Figure 2) was designed to show the probability of mental distress, utilizing the variables from the nomogram to execute the calculations. By inputting an individual's data into the app, it calculates the probability of their risk for mental distress.

**Table 1** Background information of participating study women and their partners

| Variable | Total (N=1,045) | [a]Mental distress | | *p-value |
|---|---|---|---|---|
| | | Yes (n=356) | No (n=689) | |
| Age group (years) | | | | 0.017 |
| 18–29 | 233 (22.3) | 68 (19.1) | 165 (23.9) | |
| 30–39 | 434 (41.5) | 139 (39.0) | 295 (42.8) | |
| 40–49 | 378 (36.2) | 149 (41.9) | 229 (33.2) | |
| Residence | | | | 0.004 |
| Rural | 561 (53.7) | 169 (47.5) | 392 (56.9) | |
| Urban | 484 (46.3) | 187 (52.5) | 297 (43.1) | |
| Occupation | | | | 0.129 |
| Unemployed | 511 (48.9) | 167 (46.9) | 344 (49.9) | |
| Unskilled worker | 151 (14.4) | 63 (17.7) | 88 (12.8) | |
| Skilled worker | 37 (3.5) | 15 (4.2) | 22 (3.2) | |
| Business | 346 (33.1) | 111 (31.2) | 235 (34.1) | |
| Years of schooling | | | | <0.001 |
| ≤5 | 499 (47.8) | 207 (58.2) | 292 (42.4) | |
| 6–11 | 439 (42.0) | 118 (33.1) | 321 (46.6) | |
| >11 | 107 (10.2) | 31 (8.7) | 76 (11.0) | |
| Marital status | | | | 0.002 |
| Married | 970 (92.8) | 318 (89.3) | 652 (94.6) | |
| Divorced/separated/widow | 75 (7.2) | 38 (10.7) | 37 (5.4) | |
| Number of children | | | | <0.001 |
| 1 | 330 (31.6) | 88 (24.7) | 242 (35.1) | |
| 2–3 | 555 (53.1) | 183 (51.4) | 372 (54.0) | |
| ≥4 | 160 (15.3) | 85 (23.9) | 75 (10.9) | |
| Family's debt[b] | | | | <0.001 |
| No | 380 (36.4) | 90 (25.3) | 290 (42.2) | |
| Yes | 664 (63.6) | 266 (74.7) | 398 (57.8) | |
| Perceived justification of partner violence | | | | 0.015 |
| No | 646 (61.8) | 202 (56.7) | 444 (64.4) | |
| Yes | 399 (38.2) | 154 (43.3) | 245 (35.6) | |
| Self-reported health | | | | <0.001 |
| Good health | 550 (52.6) | 141 (39.6) | 409 (59.4) | |
| Poor health | 495 (47.4) | 215 (60.4) | 280 (40.6) | |
| Partner's years of schooling[c] | | | | 0.089 |
| <=5 | 372 (36.4) | 139 (40.8) | 233 (34.2) | |
| 6–11 | 522 (51.1) | 166 (48.7) | 356 (52.3) | |
| >11 | 128 (12.5) | 36 (10.6) | 92 (13.5) | |
| Partner with controlling behaviors | | | | <0.001 |
| No | 657 (62.9) | 181 (50.8) | 476 (69.2) | |
| Yes | 387 (37.1) | 175 (49.2) | 212 (30.8) | |
| Physical violence during pregnancy | | | | 0.007 |
| No | 978 (93.6) | 323 (90.7) | 655 (95.1) | |
| Yes | 67 (6.4) | 33 (9.3) | 34 (4.9) | |
| Partner consume alcohol | | | | <0.001 |
| No | 384 (36.7) | 92 (25.8) | 292 (42.4) | |
| Yes | 661 (63.3) | 264 (74.2) | 397 (57.6) | |

*p-value were generated from chi-squared test
[a]Mental distress, HSCL-10 score (<1.6=No, 1.6=Yes), [b]1 missing due to refusal to answer, [c]23 missing due to respondent did not know

**Table 2** Multivariate analysis of associations between physical violence during pregnancy and mental distress

| | Crude OR (95% CI) | Adjusted OR (95% CI) | p-value |
|---|---|---|---|
| Experienced Physical violence during pregnancy (ref: no) | 1.96 (1.19, 3.23) | 1.35 (0.79, 2.33) | 0.274 |
| Residence (ref: rural) | | | |
| Urban | 1.45 (1.12, 1.88) | 1.68 (1.26, 2.22) | <0.001 |
| Number of children (ref: 1) | | | |
| 2–3 | 1.36 (1.01, 1.84) | 1.21 (0.87, 1.66) | 0.255 |
| ≥4 | 3.12 (2.10, 4.63) | 2.31 (1.51, 3.52) | <0.001 |
| Family's debt (ref: no) | 2.16 (1.63, 2.86) | 1.95 (1.43, 2.66) | <0.001 |
| Poor self-reported health (ref: good) | 2.23 (1.72, 2.9) | 2.22 (1.68, 2.93) | <0.001 |
| Partner with controlling behavior (ref: no) | 2.17 (1.66, 2.82) | 1.85 (1.39, 2.46) | <0.001 |
| Partner consumes alcohol (ref: no) | 2.12 (1.60, 2.81) | 2.03 (1.49, 2.73) | <0.001 |

ref, reference category.

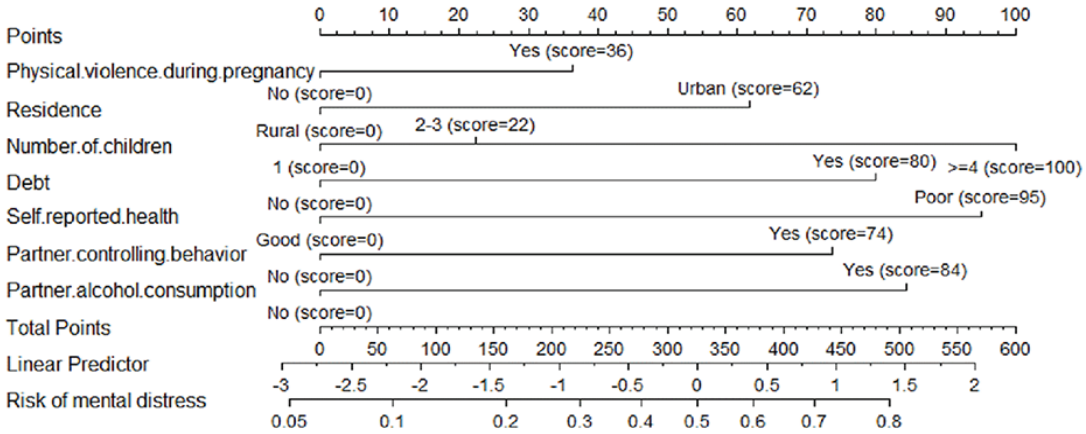


**Figure 1** Nomogram for predicting risk of mental distress among pregnant women

## Discussion

One out of every 16 of the study women had experienced physical violence during pregnancy and one-third of the women currently had mental distress. Physical violence during pregnancy was associated with higher odds of having mental distress in the univariate but not in the multivariate logistic regression. We found that other significant factors including women living in an urban area, having four or more children, having family's debt, having poor self-reported health status, having a partner with controlling behaviour, or a partner who drank alcohol, increased the risk of mental distress. All of these factors were incorporated into the nomogram, which serves as a comprehensive tool for assessing the probability of the risk of mental distress in pregnant women.

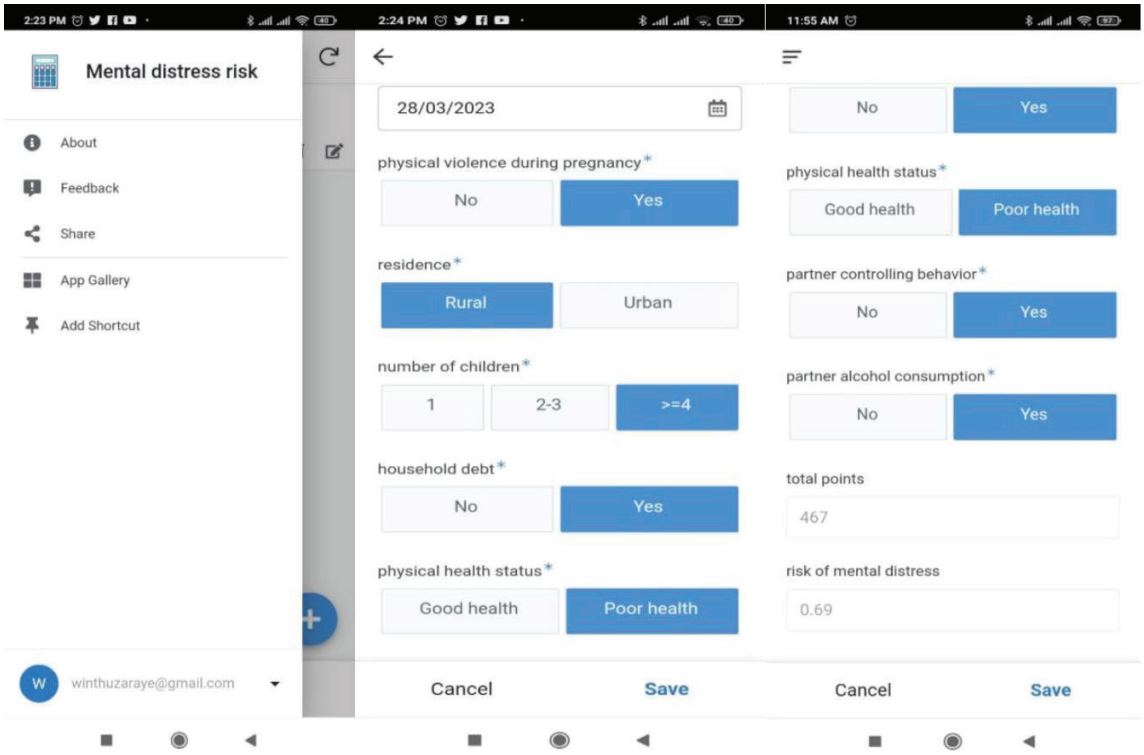


**Figure 2** Screenshot of application for prediction of mental distress in mobile PHONE application[28]

The prevalence was within the range of 2% to 35% reported in a recent systematic review and meta-analysis which included 24 studies of intimate partner violence during pregnancy in low- and middle-income countries.[9] Our study rate was higher than in Vietnam[7] and a previous report from Myanmar (1%)[23], but lower when compared to the reports from Thailand[5], Indonesia[6], and Malaysia[8]. Comparing reported prevalence rates of physical violence during pregnancy can be difficult due to differences in definitions and methodology used in different studies, as well as variations in the socio-cultural context of the study populations[3,4,9]. The underestimation of physical violence may be due to the previously reported finding that women in Myanmar believe that physical violence during pregnancy is a normal aspect of married life, and acceptance of it as a private matter, so they are reluctant to report such violence and thus the full incidence may be underestimated[21].

Our finding of the prevalence of mental distress among pregnant women in Myanmar was lower than studies from South Africa (38.6%)[26] and Brazil (43.1%)[10], where the 20-item Self-Report Questionnaire (SRQ-20) was used to assess mental distress in pregnancy. Both studies applied the summed score of less than or equal to seven as non-distress and a score equal to or greater than eight as mental distress. On the other hand, our study found a remarkably higher prevalence of mental distress compared to Vietnam (5.0%)[7] or Thailand (18.9%)[18] and a review study from low-and middle-income countries[12]. These variations in prevalence rates may be attributed to the differences in study design, methodology, and socio-demographic factors

that influence the reporting and assessment of mental distress[9,12–14]. The study women in Myanmar had been living with a long-term political crisis, low socio-economic status, natural disasters and migration, co-morbid diseases such as hypertension and diabetes, and in some cases exposure to domestic violence that may have heightened the risk of mental distress[15,27].

We found a significant association between physical violence during pregnancy and mental distress in univariate analysis, as was also found in a study conducted in Eastern Ethiopia[16]. However, it was not statistically significant in multivariate analysis which could be explained by levels of severity of physical violence during pregnancy[16] and depression or anxiety symptoms declining after childbirth due to resilience and social support[10,16].

Our study found that having family debt had a significant association with mental distress among the pregnant women. An earlier research study explored the link between debt and depression, indicating a clear and plausible connection between the two and also noted the additional contribution of poverty with financial hardship to the occurrence of mental distress[19]. Our study also found that poor self-reported health status was significantly associated with mental distress, as reported in a previous study[20]. Although the study on which our study was based did not examine this factor, chronic illnesses such as diabetes or hypertension can lead to feelings of frustration and contribute to mental distress. Moreover, financial difficulties can also be related to poor health status. Self-reported health and mental distress were measured together in other study, which found that women with a bad mood is more likely to report poor physical health[28].

A significant association between a partner's alcohol consumption and mental distress among pregnant women found in our study was aligned with a study conducted in Ethiopia, which found a strong correlation between partner's drinking and mental distress[15]. Women whose partners consume alcohol experienced higher rates of violence and perceive their partners as being less responsible within the family, leading to increased risk of mental distress among these women. Similar to our study, in a prior study involving adult women in Myanmar, it was found that those who reported experiencing controlling behaviors from their partners were more likely to be exposed to intimate partner violence and experience mental health issues compared to women who did not have partners displaying controlling behaviors[22]. One study found that the partner's controlling behaviour in Myanmar is established in traditional norms of male superiority and gender inequality[21].

The nomogram we developed incorporates all significant factors identified in our study as being associated with mental distress to estimate and visualize the probability of a woman experiencing mental distress and to calculate a risk score based on multiple variables. Despite physical violence during pregnancy not being statistically significant, we included it in the nomogram due to its importance as a risk factor for mental distress among pregnant women, affecting both the well-being of the mother and the child. The nomogram developed in this study demonstrates a good level of discrimination, as indicated by its relatively high discrimination value of 0.72. This means that the nomogram has a strong ability to distinguish between individuals who are at different levels of risk for mental distress. Furthermore, the low mean absolute error of 0.012 suggests that the predicted probabilities provided by the nomogram are highly accurate and closely aligned with the actual observed outcomes. These performance metrics are consistent with findings from a previous study conducted in China, which found a similar nomogram had good reliability and robustness across different populations[29].

A mobile app created based on our nomogram can provide respondents with a personalized and interactive

tool for assessing various factors and making prediction of risk of mental distress[30]. The app allows the respondents to input their relevant data and it displays the probability of the respondent experiencing mental distress. Additionally, the mobile app is based on a nomogram for assessing the risk of mental distress and can be a valuable tool for healthcare professionals and individuals seeking to monitor and manage their mental well-being.

This secondary analysis had some limitations. First, the original study employed a cross-sectional design which did not allow for causality inference, and this could be interpreted as a limiting factor. Second, the retrospective nature of the original study's data collection on the experience of physical violence during pregnancy might have introduced recall bias and subjective assessment by self-reported health status. However, pregnant women may feel more vulnerable, and violent events during their pregnancy may stand out in their memories. Third, both physical violence and mental distress are sensitive issues which might have introduced social desirability and/or non-disclosure bias, leading to under-estimations of the observed associations. The original study tried to minimise non-disclosure by ensuring anonymity and confidentiality, empathetic interviewer training, same-sex interviewers, and private interviews. Fourth, the findings from this study were limited to one province in Myanmar and thus are not necessarily generalisable to other parts of the country. Finally, the original survey of this study was conducted in 2016 so the data may not be applicable to the current situation. However, from 2020 until the present, the country faced the COVID-19 pandemic and ongoing unrest situations, and this study used the most recent data from a community survey for assessing physical violence and mental distress among pregnant women of the country.

Further research should be conducted in the area of physical violence and mental distress and their impact on women's mental health with diverse populations and more robust methodologies, which could provide valuable insights and contribute to the existing body of knowledge.

## Conclusion

In our study, we found that one in 16 pregnant women had experienced physical violence and one-third of women suffered mental distress in Yangon region, Myanmar. Additionally, our study highlights physical violence during pregnancy as a potential risk factor for mental distress, alongside other important factors such as urban residence, multiparity, family's debt, poor physical health, partner's controlling behavior, and partner's alcohol consumption. These findings support the need for comprehensive efforts, including legislation, prevention programs, and mental health screening, to address the complex issue of mental distress during pregnancy and ensure the well-being of pregnant women.

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## Conflict of interest

None declared.

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