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Original Research

Correlation of APGAR family with mental health: an observational study in Indonesia

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Abstract
Mental health disorders adversely affect their general health and quality of life (Wang et al., 2020). In Indonesia, the prevalence in 2018 was 6.1%, and mental-emotional disorders were 9.8% (Kemenkes RI, 2019). A systematic review reported that in many studies, it is stated that the family has a protective role against mental health disorders or behaviors that affect mental health in general (Wlodarczyk et al., 2017). Studies specifically evaluating the effect of family functioning on mental health in thepresence of symptoms of depression, anxiety, and stress are limited. This study used a cross-sectional study design, evaluating the relationship between family functioning and mental health at one time. This study outputsdata from Field Lab activities in the Public Health and Family Medicine Block and Life Skills Block in two different batches in 2020 and 2021 at the Faculty of Medicine, Universitas Muhammadiyah Surakarta. A total of 1475 research subjects voluntarily participated in this study. In this study, multivariate analysis of statistically consistent variables highly significant on depression, anxiety, and stress is APGAR Family, with p values of 0.000, 0.000, and 0.001, respectively. The second statistically consistent variable is a significant-highly significant effect on the level of depression, anxiety, and stress with p values of 0.001, 0.015, and 0.001, respectively. A dysfunctional family and unmarriedness are consistent risk factors for depression, anxiety, and stress disorders.

Keywords: APGAR family; family function; mental health

1. Introduction

Mental health disorders adversely affect their general health and quality of life (Wanget al., 2020). In Indonesia, depression in 2018 was 6.1%, and mental-emotional disorders were 9.8% (Kemenkes RI, 2019). During the COVID-19 pandemic, isolationat home leads to cleadsentary behavior, smoking, an unbalanced diet, and increased perceptions of mental health disorders (Blom et al., 2021). Mental disorders significantly impact various aspects of the sufferer's life, such as academic achievement (Bortes et al., 2019).

Before the COVID-19 pandemic, various studies have shown that family function positively affects mental health outcomes (Cheung et al., 2019; Jurado et al., 2019). A systematic review reported that in many studies, the family has a protective role against mental health disorders or behaviors that generally affect mental health (Wlodarczyk et al., 2017). Interventions provided to family caregivers provide better outcomes than the patients themselves while improving family functioning (Rodríguez-Snchez et al., 2010). The opposite situation of severe illness or severe mental illness in one family member significantly impacts the family in various aspects of life, such as financial, career and triggers mental health disorders in other family members (Panganiban-Corales & Medina, 2011a; Fekadu et al., 2019). Due to the importance of the family in its influence on the mental health of individual family members and the reverse impact, the family has a major role as a primary care unit (Chen et al., 2019). Poor family functioning in a study increased the risk of mental disorders and unhealthy behaviors in a group of adolescents in a situation not related to the COVID-19 pandemic

(Tamayo-Aguledo et al., 2022; Kroplewski et al., 2019; Gonzálvez et al., 2019). However, some studies show that family functioning does not influence health outcomes but rather the influence of family support with autistic children (Khotibuddin & Shellia, 2022). There are relatively many studies evaluating the impact of the COVID-9 pandemic on mental health, but limited studies linking it to family functioning (Salazar et al., 2021; García-Álvarez et al., 2020; Orfei et al., 2022; Odriozola-González et al., 2020; Masud et al., 2021).

To regulate family functioning, an assessment instrument called APGAR Family was developed. APGAR Family is a short screening questionnaire designed to reflect family members' satisfaction with the functional status of the family and is used to record household members. The APGAR Family instrument contains five core family functions: adaptation, partnership, growth, love, and togetherness. Studies specifically evaluating the effect of family functioning on mental health in the presence of symptoms of depression, anxiety, and stress are limited. During the COVID-19 pandemic, limited studies evaluated the correlation between the two in Indonesia's context of the relationship between family functioning and mental health. This study, therefore, aims to examine the relationship between family functioning and the presence of depression, anxiety, and stress symptoms in the Indonesian population during the COVID-19 pandemic.

2. Research Methods

This study used a cross-sectional study design, evaluating the relationship between family function and mental health at one time. This study outputs data from Field Lab activities in the Public Health and Family Medicine Block and Life Skills Block in two different batches in 2020 and 2021 at the Faculty of Medicine, Universitas Muhammadiyah Surakarta. The students have passed the Laboratory Skills course for anthropometric examination and interview skills. Because it was conducted during the ongoing COVID-19 pandemic, the research subjects were close family membersor neighbors who were healthy and confirmed to be safe from the COVID-19 transmission chain.Health protocols were upheld during data collection. Each respondent was given an adequate explanation and gave consent afterward. Data obtained from research subjects include demographic data such as age, gender, occupation, religion, marital status, income level, family function with the APGAR family questionnaire, and the level of depression, anxiety, and stress using the validated Indonesian version ofthe DASS-21 questionnaire (Muttaqin & Ripa, 2021). The Indonesian version of the APGAR family questionnaire has been validated with an item-total correlation of 0.77-0.90 and a scale reliability coefficient of 0.89. (Ridwan et al., 2022). Statistical analysis used the Chi-Square test for bivariate analysis, while multivariate used the logistic regression test. Variables tested included age, gender, education level, marital status, occupation of a housewife (IRT) vs. non-IRT, employment status of a civil servant (ASN) vs. non-ASN, income level, and APGAR Family. This study has been reviewed by the Research Ethics Commission of the Faculty of Medicine, Universitas Muhammadiyah Surakarta, and declared ethically feasible, with an ethical feasibility letter number no. 3098/B.2/KEPK- FKUMS/I/2021.

3. Results and Discussion

3.1.Results

A total of 1475 research subjects voluntarily participated in this study. The mean age of respondents was 39 years, with the youngest being 15 and the oldest being 91. Gender distributionwas almost equal between men and women, the majority were Muslim, about two-thirds were married, and respondents' occupations were evenly distributed across various types of work, with the two highest being students and self-employed. Over two-thirds of respondents had less than 12 years of formal education, almost equally distributed between incomes below the minimum wage [IDR 2.5 million] andat or above it. On

average, APGAR-family, depression, anxiety, and stress levels were within functional and normal ranges Table 1.

Table 1. Respondent Characteristics [n=1475]

No	Variabel [attribute]	Mean / Σ	SD / %	Min	Maks
1.	Age (year)	39	15.47	15	91
2.	Gender				
	Male	688	46.6		
	Female	787	53.4		
3.	Religion				
	Buddha	3	0.2		
	Islam	1439	97.6		
	Catholic	14	0.9		
	Kristen	19	1.3		
4.	Marital status				
	Marry	967	65.6		
	Not married	508	34.4		
5.	Occupational				
	Private employees / BUMN /BUMD	239	16		
	Farmer/fisherman/laborer	74	5		
	Not working yet	55	4		
	Self-employed	283	19		
	Doctor / drg	11	1		
	Housewife	178	12		
	PNS	202	14		
	Student	398	27		
	Retirement	20	1		
	TNI / POLRI	15	1		
6.	Education				
	12 years +	549	37.2		
	< 12 years	926	62.8		
7.	Revenue				
	2.5 million+	598	40.5		
	< 2.5 million	877	59.5		
8.	APGAR Family	8.84	1.65	0.00	10.00
9.	Depression	2.03	2.34	0.00	17.00
10.	Anxietas	2.78	2.53	0.00	16.00
11.	Stress	3.27	2.95	0.00	30.00

Source: Primary data, 2020 & 2021

Table 2. Bivariate and multivariate analysis of risk factors for depression

Variables	Attributes	Depression level		Bivariate analysis		Multivariate analysis	
		Normal (n =1291) n (%)	Depression (n=184) n (%)	OR	p	aOR	p
Age	≤ 40 years	557 (81.8)	124 (18.2)	0.367	0.000	0.604	0.037
	> 40 years	734 (92.4)	60 (7.6)				
Gender	Men	615 (89.4)	73 (10.6)	1.383	0.043	1.245	0.211
	Women	676 (85.9)	111 (14.1)				
Education level	≥ 12 years	487 (88.7)	62 (11.3)	1.192	0.291	0.806	0.273

Variables	Attributes	Depression level: Normal (n =1291) n (%)	Depression level: Depression (n=184) n (%)	Bivariate analysis: OR	Bivariate analysis: p	Multivariate analysis: aOR	Multivariate analysis: p
	< 12 years	804 (86.8)	122 (13.2)				
Marriage Status	Marry	886 (91.6)	81 (8.4)	2.782	0.000	2.305	0.001
	Not married	405 (79.7)	103 (20.3)				
Jobs	non IRT	1132 (87.3)	165 (12.7)	0.820	0.439	1.293	0.419
	IRT	159 (89.3)	19 (10.7)				
Employment status	ASN	188 (94.0)	12 (6.0)	2.443	0.004	1.725	0.122
	Non-ASN	1103 (86.5)	172 (13.5)				
Revenue	≥ Rp. 2,500,000	539 (90.1)	59 (9.9)	1.519	0.013	0.738	0.187
	< Rp. 2,500,000	752 (85.7)	125 (14.3)				
APGAR family	Functional	1095 (90.5)	115 (9.5)	3.352	0.000	3.302	0.000
	Dysfunctional	196 (74.0)	69 (26.0)				

Source: Primary data, 2020 & 2021
OR=Odds ratio, aOR=adjusted Odds Ratio

Table 3. Bivariate and multivariate analysis of risk factors for anxiety level

Variables	Attributes	Anxiety level: Normal (n = 989) n (%)	Anxiety level: Anxiety (n = 486) n (%)	Bivariate analysis: OR	Bivariate analysis: p	Multivariate analysis: aOR	Multivariate analysis: p
Age	≤ 40 years	421 (61.8)	260 (38.2)	0.644	0.000	0.846	0.323
	> 40 years	568 (71.5)	226 (28.5)				
Gender	Men	483 (70.2)	205 (29.8)	1.308	0.016	1.237	0.091
	Women	506 (64.3)	281 (35.7)				
Education level	≥ 12 years	395 (71.9)	154 (28.1)	1.434	0.002	1.369	0.030
	< 12 years	594 (64.1)	332 (35.9)				
Marriage Status	Marry	687 (71.0)	280 (29.0)	1.674	0.000	1.583	0.015
	Not married	302 (59.4)	206 (40.6)				
Jobs	non IRT	873 (67.3)	424 (32.7)	1.100	0.569	1.313	0.196
	IRT	116 (65.2)	62 (34.8)				
Employment status	ASN	188 (94.0)	12 (6.0)	2.443	0.004	0.741	0.141
	Non-ASN	1103 (86.5)	172 (13.5)				
Revenue	≥ Rp. 2,500,000	539 (90.1)	59 (9.9)	1.519	0.013	0.828	0.242
	< Rp. 2,500,000	752 (85.7)	125 (14.3)				
APGAR Family	Functional	865 (71.5)	345 (28.5)	2.851	0.000	2.811	0.000
	Dysfunctional	124 (46.8)	141 (53.2)				

Source: Primary data, 2020 & 2021
OR=Odds ratio, aOR=adjusted Odds Ratio

Table 4. Bivariate and multivariate analysis of stress risk factors

Variables	Attributes	Stress level		Bivariate analysis		Multivariate analysis	
		Normal (n = 1367) n (%)	stress (n = 108)n (%)	OR	p	aOR	p
Age	≤ 40 years	613 (90.0)	68 (10.0)	0.478	0.000	0.664	0.161
	> 40 years	754 (95.0)	40 (5.0)				
Gender	Men	651 (94.6)	37 (5.4)	1.745	0.008	1.525	0.069
	Women	716 (91.0)	71 (9.0)				
Education level	≥ 12 years	511 (93.1)	38 (6.9)	1.100	0.650	0.818	0.408
	< 12 years	856 (92.4)	70 (7.6)				
Marriage Status	Marry	913 (94.4)	54 (5.6)	2.011	0.001	2.305	0.001
	Not married	454 (89.4)	54 (10.6)				
Jobs	non IRT	1207 (93.1)	90 (6.9)	1.509	0.130	2.470	0.011
	IRT	160 (89.9)	18 (10.1)				
Employment status	ASN	194 (97.0)	6 (3.0)	2.812	0.016	2.453	0.056
	Non-ASN	1173 (92.0)	102 (8.0)				
Revenue	≥ Rp. 2,500,000	557 (93.1)	41 (6.9)	1.124	0.571	0.445	0.003
	< Rp. 2,500,000	810 (92.4)	67 (7.6)				
APGAR Family	Functional	1136 (93.9)	74 (6.1)	2.260	0.000	2.148	0.001
	Dysfunctional	231 (87.2)	34 (12.8)				

Source: Primary data, 2020 & 2021
OR=Odds ratio, aOR=adjusted Odds Ratio

In multivariate analysis, the statistically consistent, highly significant variable on depression, anxiety, and stress was the APGAR Family, with p values of 0.000, 0.000, and 0.001, respectively. The second statistically consistent, highly significant variable had a highly significant effect on the level of depression, anxiety, and stress with p-values of 0.001, 0.015, and 0.001, respectively. When broken down further, statistically significant risk factors for depression include age 40 years and under, not being married, and having a dysfunctional family. Risk factors for anxiety that are statistically significant - highly significant- education less than 12 years, unmarried, and dysfunctional family. While risk factors for stress include not being married, housewife occupation, income less than IDR 2.5 million, and a dysfunctional family.

3.2. Discussion

The prevalence of symptoms of depression, anxiety, stress, and dysfunctional family was found to be 184/1475 (12.47%), 486/1475 (32.95%), 108/1475 (7.32%), and 265/1475 (17.97%), respectively. In this study, dysfunctional and unmarried families were statistically consistent in their influence on all three mental health disorders: depression, anxiety, and stress. As detailed in the following description, family functioning is a buffer against the risk of mental health disorders. Commonly used measures of mental disorders are depression, anxiety, and stress scores. From various studies, family functioning is a buffer from mental health disorders and has a broader influence on various health-related behaviors.

In this study with a wide age range of 15 - 91 years, in a study involving research subjects in a wide age range of 18-48 years, it was found that APGAR-family or family functioning influenced reducing eating disorders and increasing self-confidence, where self-confidence was intermediate. The Variable of family functioning with eating disorders (Kroplewski et al., 2019). The family is also an important source that influences family members in increasing/decreasing commitment,

resisting/committing to health behavior promotion, and family health behavior (Martono et al., 2023). Studies that evaluate juvenile delinquency also show a significant role of the APGAR family as a protective factor from adolescent refusal behavior (Gonzálvez et al., 2019). Physical self-concept is one of the other mental health measures correlated with the APGAR family (Padial-Ruz et al., 2020). One aspect of family functioning, such as low spousal adjustment to self/family circumstances from multi-cultural marriages, affects the tendency to engage in unhealthy behaviors such as smoking, alcoholconsumption, lack of exercise, and weight gain (Lee et al., 2019). Family functioning (APGAR family)supports family members suffering from chronic diseases so that their quality of life is better than those lacking in tuberculosis cases with multi-drug resistance (Desyawalsah et al., 2023). Family support in overweight autistic family members was statistically significantly lower than in norm-weight autistic and non-autistic ones. However, there was no significant difference in the APGAR Family score between the three groups (Khotibuddin & Shellia, 2022).

Another study on people with disabilities found that family functioning (APGAR Family score) wassignificantly correlated with quality of life in various aspects (Susanti et al., 2022). In the case of type2 diabetes, APGAR Family score and age had a 10.6% contribution in predicting the incidence of depression in that patient group (Mutmainah et al., 2018). Moderate/severe dysfunctional family function increases the risk of frailty 12.5 times (95% CI 2.998-38.038; $p < 0.01$) in farming families in Lampung (Larasati & Eiska, 2023). In a group of medical students during the COVID-19 pandemic, a functional family reduced the risk of developing symptoms of depression, anxiety, and stress consequences arising from a heavy learning load (Mallaram et al., 2023). Family functioning is one of the dimensions of the family that is needed when there are aggravating conditions of family members, such as disabilities and various other catastrophic factors (Susanti et al., 2022).

Most discussions of the correlation between the APGAR family and mental health are often in the context of respondents' severe health conditions, such as a study that evaluated the role of family functioning [APGAR-family] in relieving psychological distress and general well-being, where the respondents were patients with end-stage renal disease (Wang et al., 2020). Other studies have used the APGAR family as an outcome. For example, the average amount of time spent with spouses of cervical cancer patients increases the APGAR-family score (Wilkerson et al., 2009). In a study that evaluated the interaction of various factors affecting the level of depression, it was found that a dysfunctional family increased the risk of depression in both bivariate and multivariate analyses (Romadhon & Sintowati, 2021).

In the COVID-19 pandemic, dysfunctional families from various literatures have consistently played a role in various adverse mental conditions. Research in Peru in groups of children and adolescents shows moderate and severely dysfunctional families have a higher prevalence of post-traumatic stress disorder (PTSD) (Fernandez-Canani et al., 2022). This study found that income deprivation was a risk factor for stress symptoms. Compared to other studies, such as research on elderly groups, low income and retirement from work increase the risk of encountering higher depressive symptoms during the COVID-19 pandemic. This study also found that a highly functional family was a protective factor for depressive symptoms (Kurniawidjaja et al., 2022).

There are other constructs related to the family dimension of health outcomes, such as family resources(family beliefs and religion) which in the literature are important in evaluating the family dimension (Panganiban-Corales & Medina, 2011b). This aspect is a limitation in this study to evaluate more comprehensive family dimensions on mental health outcomes. Another limitation is that other non-family dimension constructs also influence mental health outcomes that need to be evaluated, such as self-concept, emotional self-concept, social self-concept, and family self, which need to be analyzed (Padial-Ruz et al., 2020).

4. Conclusion

Dysfunctional and unmarried families are consistently risk factors for depression, anxiety, and stress disorders. In this study, the APGAR family was negatively correlated with levels of depression, anxiety, andstress. The better the family functioning, the lower the levels of depression, anxiety, and stress. This conclusion implies that improving family functioning is a protective factor against high levels ofdepression, anxiety, and stress.

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