

# Evaluation of loneliness, social self-efficacy, and burnout relationship: A short-term longitudinal study

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# Evaluation of loneliness, social self-efficacy, and burnout relationship: A short-term longitudinal study

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## ABSTRACT

This study examines the impact of loneliness related online learning on students during emergency remote teaching. Specifically, this study aims to: (1) evaluate the consistency between times of loneliness, burnout, and social effects, (2) examine the differences in the three measurements based on gender, and (3) examine the detrimental effects of loneliness on burnout and social self-efficacy of students at two Islamic state universities. Using a short-term longitudinal study design involving 237 students from two state Islamic universities. Data were analyzed using descriptive, comparative, correlation, and regression to test the proposed model. The results showed that loneliness and burnout at one point in time could consistently predict loneliness and burnout in the future. Concerning the results, gender does not seem consistent as a potential predictor of loneliness, burnout, and social self-efficacy. The results of this study revealed that loneliness was higher for female students, while burnout was higher for boys. There was no significant difference in social self-efficacy between male and female students at the two-time points.

**Keywords:** *loneliness, burnout, social self-efficacy, COVID-19, online learning*

## Introduction

In March 2020, the Indonesian government declared an emergency regarding coronavirus disease (COVID-19). Several preventive measures were taken, including imposing social distancing, closing locations and crowd centers, and moving student learning activities to emergency remote teaching (ERT). For two years, students carried out learning activities using online media, and until early 2022, with the drastic decline in COVID-19 cases, various physical activities were reactivated. In the education sector, face-to-face activities have been implemented at primary and secondary school levels. In contrast, there is a transition from ERT to blended mode at the university level.

Despite the various barriers to ERT learning (e.g., connectivity and technological barriers) that are experienced in almost all countries, there is also an increasing trend of “connection crises” and “loneliness epidemics” (Cohan 2017; Kaufmann and Vallade 2020). A high level of loneliness among students raises new concerns, especially regarding the long-term psychological development of students. Although online learning has various advantages, especially regarding flexibility, the lack of direct social interaction leads to high reports of loneliness experienced by students in various countries (Labrague and De los Santos 2020; Werner et al. 2021; Haikalis et al. 2022; McHugh Power et al. 2019). In Indonesia, a study reported that the phenomenon of loneliness in students had caused a decrease in student engagement and academic achievement during ERT (Mizani et al. 2022). In response to Mizani et al. (2022) to explore the continued effects of loneliness on student learning behavior, the current study tries to provide new insights regarding the relationship between students’ loneliness, burnout, and social self-efficacy in transitioning of ERT to blinded mode.

Existing studies have documented that loneliness-related COVID-19 experienced by students has a detrimental effect on students' attitudes and behavior. Loneliness is an effective predictor of mental health and well-being (Diehl et al. 2021; Kaufmann and Vallade 2020; Wu, Wu, and Tian 2022; Haikalis et al. 2022; Mehus et al. 2021), reducing student engagement (Mizani et al. 2022; Rolandi et al. 2020), and decreased academic achievement (Singh, Kumar, and Srivastava 2021; Mizani et al. 2022; Yalçın et al. 2020). In addition, a high level of loneliness is also associated with increased burnout (Gradiski et al. 2022; Singh, Kumar, and Srivastava 2021; Arasli, Hejraty Namin, and Abubakar 2018) and decreased students’ social self-efficacy (Wickens et al. 2021; Child and Lawton 2019).

The present study evaluates differences in loneliness, burnout, and social self-efficacy based on gender as the first goal. In particular, we wanted to validate these differences by gender, which previously had mixed results. For example, some studies report that female students have higher levels of burnout than boys (Herrmann, Koeppen, and Kessels 2019; Worly et al. 2019; Gold et al. 2021; Warshawski 2022), but other studies report otherwise (Gong et al. 2021). On the other hand, burnout is said to be closely related to culture (Schaufeli 2003; Molodynski et al. 2021), so differences in results may occur. In the same vein, different results were also found to be related to differences in levels of self-efficacy by gender. Several studies (Warshawski 2022; Alemany-Arrebola et al. 2020; Andretta and McKay

2018) reported that male students had higher self-efficacy than female students, and others reported that gender did not affect self-efficacy (Salavera, Usán, and Jarie 2017; Salado et al. 2022). Accordingly, the present study will examine differences in loneliness, burnout, and social self-efficacy based on gender as the first goal.

Furthermore, the second objective<sup>12</sup> of the present study is to examine the relationship between loneliness, burnout, and social self-efficacy<sup>17</sup>. Although various studies have proven the relationship between these three variables, two main limitations in previous studies need to be addressed: the placement of interchangeable variables. For example, Singh et al. (2021) and Kloutsiniotis et al (2022) place burnout as a predictor of loneliness. In contrast, Gradiski et al. (2022) suggest that loneliness as a factor that affects burnout. Second, this study responds to the call of previous studies (Wu, Wu, and Tian 2022; Feldman et al. 2016; Andretta and McKay 2018) to clarify the temporary effect of loneliness on self-efficacy<sup>18</sup>. Feldman et al. (2016), the effect of loneliness on self-efficacy is temporary and only significant if the two are measured in a relatively close time. In addition, Andretta and McKay (2018) only focus on loneliness, measured at two-time points, while social self-efficacy is measured at one time. The present study re-examines loneliness and social self-efficacy using two different time points. Using a short-longitudinal data design, this study was developed more broadly by examining the effects of loneliness on burnout which were not previously carried out by Andretta and McKay (2018) and Feldman et al. (2016). Thus, the present study investigated these associations over time.

In short, the present study investigates three questions. First, we will examine the consistency between times of loneliness, burnout, and social self-efficacy in two independent samples of students at two state Islamic universities across six months. These results will support the internal validity and consistency of measurements across time on the three constructs studied. Secondly, we examine differences in loneliness, burnout, and social self-efficacy by gender. Since women are considered to be more sensitive to having more excellent intentions of social interaction (Barreto et al. 2021; Liu et al. 2020), we expect that women's scores on loneliness, burnout, and social self-efficacy are higher than their male counterparts. Finally, we examined the effect of loneliness on burnout and social self-efficacy. Following Mizani et al. (2022), a present study uses the Cacioppo Evolutionary Theory of Loneliness (ETL) (Cacioppo and Cacioppo 2018) to explain the short and long-term effects of loneliness on burnout and social self-efficacy. We hope loneliness has a

positive effect on burnout and a negative effect on <sup>2</sup>social self-efficacy (see Figure 1). These findings will provide new insights regarding the temporary and long-term effects of student loneliness on learning-related behavior, especially during the transition from online to blended learning.

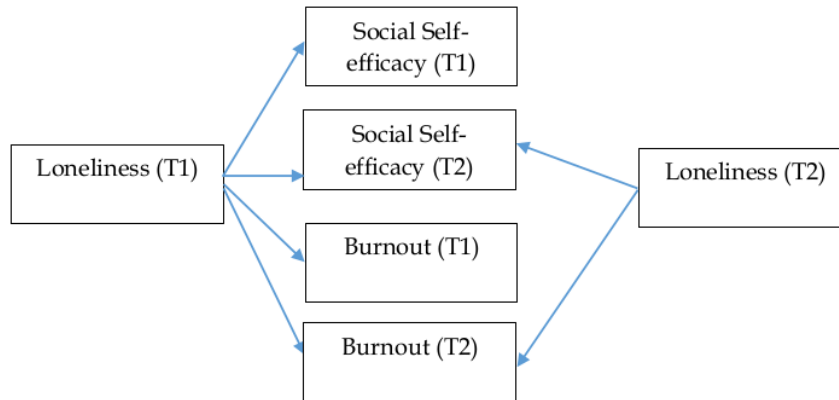


Figure 1. Research model

## Methodology

### Participants and procedures.

The research sample used a purposive method involving two Islamic public universities that were willing to become collaborators in data collection. Data collection uses a short-term longitudinal study approach where data collection is carried out at two different time points. The first stage is the end of the semester (April 2022), where students are asked to answer questions about loneliness, burnout, and social self-efficacy. The second data collection stage was carried out at the beginning of the next semester (September 2022). Students were invited to answer questions about loneliness, burnout, and social self-efficacy. A total of 342 students voluntarily filled out the questionnaire, and after eliminating incomplete data, 237 respondents were used as the final data. The respondents comprised 68.4 percent of females student and 31.6 percent of males. Most respondents (86.9 percent) are unemployed, and only 13.1 percent are already employed. Furthermore, most respondents were first-year students (51.9 percent), and 46.4 percent were second-year students.

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Table 1. Characteristics of Respondents

Characteristics	n	Percent
<b>Gender</b>		
Male	75	31.6
Female	162	68.4
<b>Employment status</b>		
Unemployed	206	86.9
Employed	31	13.1
<b>Grade</b>		
1 <sup>st</sup> grade	123	51.9
2 <sup>nd</sup> grade	110	46.4
3 <sup>rd</sup> grade	4	1.7

### Measurement

The measurement model for all variables was adapted from previous research. Loneliness adapted from Hays and DiMatteo (1987).. Examples of items are, 'I do not have close friends and 'people are around me, but not with me'. Academic burnout was adapted from the exhaustion (Bresó, Salanova, and Schaufeli 2007) with 5 question items. Examples are "I feel emotionally drained by my studies" and "I feel tired after taking online classes." Social self-efficacy was adapted from 3 items developed by Kim et al. (2020). Examples of items are "I can express my opinion well when friends/classmates have different thoughts from mine" and "I can work well with classmates on group projects."

Table 2. The evaluation of the measurement model

Construct	Indicator	Factor Loading	Cronbach Alpha
Loneliness	lon1	.700	0.805
	lon2	.555	
	lon3	.241	
	lon4	.792	
	lon5	.819	
	lon6	.540	
	lon7	.526	
	lon8	.642	
Academic Burnout	burn1	.743	0.817
	burn2	.744	
	burn3	.750	
	burn4	.759	
	burn5	.807	
Social Self-Efficacy	sse 1	.740	0.762

sse2	.796
sse3	.730

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The results of the validity test show that one item (lon3) in the loneliness construct is invalid (factor loading < 0.50), so it is eliminated from the measurement model (Hair et al. 2010). In contrast, all other items are declared valid. Furthermore, the reliability test results with the Cronbach alpha coefficient showed that all constructs already had good internal consistency (CA > 0.70) (Nunnally and Bernstein 1994). Thus, the full scale used in this study has met the validity and reliability.

### **Analysis technique**

This study uses several stages of analysis. Previous studies (i.e., Feldman et al., 2016; Tsai et al., 2017) applied comparative, correlation, and regression test techniques. A comparative test was conducted to examine differences in loneliness, burnout, and social self-efficacy based on gender. Next, correlation analysis is used to test the relationship between variables. Finally, a linear curve was applied to examine the non-linear relationship between loneliness, burnout, and social self-efficacy based on time points.

## **Results and discussion**

### **Descriptive statistics and consistency between time 1 and 2**

The first stage of the analysis displays a description of the data, as presented in Table 1. The results show the distribution of loneliness, burnout, and social self-efficacy scores at two different times. The loneliness score at T1 is 2,828, slightly smaller than the score at T2 is 3,149. For burnout, T1 obtained a score of 2,389, relatively the same as T2 (M = 2,369). The social self-efficacy score at T1 was 3,561, and T2 was slightly higher at 3,924. The results of this initial description indicate that the score invariance on the three constructs is relatively stable for burnout and social self-efficacy. At the same time, in loneliness, there is an increase in scores between T1 to T2. The correlation between time points also shows that loneliness on T1 is correlated with T2 of 0.608. The correlation between burnout (T1 and T2) is 0.610, and social self-efficacy (T1 and T2) is 0.199. These correlations are in the positive direction, indicating a stable relationship over time.

**Table 2.** Descriptive statistics and relations between Time 1 and Time 2 measures of each construct

No	Construct	Mean	SE	1	2	3	4	5	6
1	Burnout (T1)	2.828	.691	1					
2	Burnout (T2)	3.149	1.029	.608	1				
3	Lone (T1)	2.389	.821	.469	.330	1			
4	Lone (T2)	2.369	.853	.267	.160	.610	1		
5	SSE (T1)	3.620	.974	-.179	-.080	-.228	-.073	1	
6	SSE (T2)	3.924	.855	-.162	-.240	-.127	-.187	.199	1

### The gender differences

The analysis results on differences in the mean scores of loneliness, burnout, and social self-efficacy observed based on gender are shown in Table 3. First, the test results of the mean score for loneliness (T1) are not significantly different between men and women ( $\text{sig} > 0.05$ ). However, for T2, the mean score between males and females was significantly different ( $\text{Sig } 0.004 < 0.05$ ). Second, burnout at T1 was not significantly different based on gender; however, at T2, the scores were significantly different ( $\text{Sig } 0.029 < 0.05$ ). Third, social self-efficacy for T1 is insignificant different among male and female students for T1 and T2.

Table 3. Differences in mean scores by gender

Construct	Gender	N	Mean	Mean Difference	F	Sig.	t
lone1	Male	75	2.776	-0.076	5.074	0.433	-0.785
	Female	162	2.852				
lone2	Male	75	2.870	-0.408	0.187	0.004	-2.881
	Female	162	3.278				
burn1	Male	75	2.472	0.121	5.384	0.290	1.059
	Female	162	2.351				
burn2	Male	75	2.547	0.260	1.793	0.029	2.197
	Female	162	2.287				
sse1	Male	75	3.800	0.165	0.751	0.225	1.218
	Female	162	3.451				
sse2	Male	75	3.920	0.006	2.610	0.961	-0.052
	Female	162	3.926				

The analysis results show that the measurement of loneliness for men and women is relatively the same at T1. However, the scores differ at T2, where the mean score for female respondents is higher than for male students. For burnout, male and female students are relatively the same at T1, but at T2, the mean score for males is relatively higher than for



females. Finally, social self-efficacy at T1 was insignificant different for T1 and T2. According to the situation, the difference in mean scores seems very susceptible to change. However, these results indicate that female respondents reported higher levels of loneliness than males at T1 and T2. As for burnout, male respondents consistently reported higher levels of burnout than females for T1 and T2. Meanwhile, for social self-efficacy, male respondents reported higher scores at T1 and vice versa for T2.

### The regression analysis

Regression in the basic model is used to evaluate the causal relationship of loneliness to burnout and social self-efficacy. The analysis results show that four relationships have been successfully proven, namely loneliness (T1) significantly affecting burnout (T1 and T2). Furthermore, loneliness (T1) significantly affects social self-efficacy (T1) but not significantly on self-efficacy (T2). Loneliness (T2) significantly affects social self-efficacy (T2). In contrast to the initial assumption, loneliness (T1) does not significantly affect social self-efficacy (T2). In addition, loneliness (T2) also does not significantly affect burnout (T2).

Table 4. Model analysis

Model	$\beta$	SE	t	Sig
Lone (T1) -> Burnout (T1)	0.464	0.059	7.981	0.000
Lone (T1) -> Burnout (T2)	0.367	0.089	4.186	0.000
Lone (T1) -> SSE (T1)	-0.228	0.072	3.191	0.002
Lone (T1) -> SSE (T2)	-0.020	0.088	0.233	0.815
Lone (T2) -> Burnout (T2)	-0.065	0.091	0.758	0.449
Lone (T2) -> SSE (T2)	-0.174	0.084	2.075	0.038

### Discussion

This study pays attention to loneliness during the transition from emergency remote teaching to a blinded mode where some students have had face-to-face meetings. This study responds to the inconsistency of previous research findings regarding the effects of loneliness on student learning behavior (Feldman et al., 2016; Andretta & McKay, 2018) and captures the phenomenon of loneliness based on time points and gender.

First, this study's results confirm a positive relationship between time one and time two on all scales tested. The effect of loneliness from time 1 to time 2 is positive 0.610, indicating that students who reported loneliness at time 1 were relatively consistent with loneliness six months later (time 2). These results align with Feldman et al. (2016), who found a positive and stable effect over time on student loneliness. Burnout time one was also shown to significantly affect burnout time 2, indicating that students who reported burnout at time 1 were consistent with the level of burnout time 2. While social self-efficacy <sup>13</sup> time 1 had a weak positive effect on self-efficacy time 2. These results provide information that there are reports of students with relatively inconsistent social self-efficacy where the change in online learning mode at time 1 to blinded time two is corrected. The higher level of social self-efficacy at time two may be due to social interaction in learning activities, where most students have run the face-to-face learning mode. Thus it is logical if there is a change in students' attitudes toward social self-efficacy and an increase in direct social interaction. In other words, the pandemic may have affected perceived social self-efficacy due to social restrictions (Wickens et al. 2021; Child and Lawton 2019) due to government policies limiting all activities, including education.

Second, our study examines differences in loneliness, burnout, and social self-efficacy by gender. The study's results revealed mixed findings, loneliness T1 reported by male and female students was relatively the same. At the same time, at T2, there was a significant difference between male and female students. As expected, women <sup>9</sup> reported higher levels of loneliness than men, thus supporting previous findings (Wickens et al. 2021; Barreto et al. 2021; Liu et al. 2020). The difference in loneliness scores between male and female students is because, in general, women prefer participation and interaction activities and are more sensitive to interpersonal relationships than men (Barreto et al. 2021; Liu et al. 2020). Consequently, when social activity is restricted, women will report higher levels of loneliness than their male counterparts.

Furthermore, this study's results also revealed no significant difference in T1 burnout between women and men. However, on T2, the burnout of male students was relatively higher than that of women. This result contrasts previous studies (Herrmann, Koeppen, and Kessels 2019; Worly et al. 2019; Gold et al. 2021; Warshawski 2022), which reported higher burnout in female students than their male counterparts. However, this study is in line with other findings that reported higher burnout in men than women (Gong et al. 2021). This difference is considered reasonable, considering that burnout is closely related to culture

(Schaufeli 2003; Molodynski et al. 2021), so differences in results may occur. Thus, based on existing literature, studies conducted in Europe and America tend to report higher burnout in women, while those in Asia report the opposite result.

Regarding social self-efficacy, this study revealed no difference between men and women at T1 and T2, indicating that both male and female students reported the same level of self-efficacy. The results of this study differ from previous findings (Warshawski 2022; Alemany-Arrebola et al. 2020; Andretta and McKay 2018), which reported that male students had higher self-efficacy than female students. However, referring to several other studies (Salavera, Usán, and Jarie 2017; Salado et al. 2022), gender does not have a bias on self-efficacy. This difference again shows that social self-efficacy, an individual's belief in their social abilities, is highly dependent on the situation where this study was conducted during the transition from remote teaching to blended learning.

Third, the findings suggest that loneliness time significantly affects burnout (T1 and T2) and social self-efficacy (T1). Thus, students who reported high loneliness at Time 1 tended to have high burnout simultaneously (T1) and the following six months (T2). Correspondingly, significant results were also found on the effect of loneliness T2 on T2's social self-efficacy. However, there was no significant effect of T1 loneliness on social self-efficacy Time 2. This finding illustrates that students who reported high loneliness at the T1 only significantly affected the decrease in social self-efficacy at the same time (T1), but the relationship was not significant for the next six months (T2). The relationship between loneliness and self-efficacy appears to be a temporary and short-term relationship (Wu, Wu, and Tian 2022; Feldman et al. 2016). Similar results were also found by Wu et al. (2022), who found a short-term relationship between loneliness and mental health (anxiety, depression, and self-esteem). Feldman et al. (2016) previously also found a short-term effect of loneliness on self-efficacy, where the two were significantly related when measured simultaneously. Meanwhile, the effect of loneliness on burnout is relatively stable even though it is measured in two different time points, indicating that loneliness is a dominant predictor of burnout in the short and long term. The results of this study provide new knowledge regarding the effects of loneliness on student behavior. This study strengthens support for the temporary effect of loneliness on social self-efficacy but is relatively stable for burnout.

### **Limitations**

This study has limitations that need future research attention. First, data were collected at two similar Islamic universities so that they were not representative of students from private universities. Thus, future studies need to expand the study area to various universities, combining private and public universities to strengthen generalizations. Second, although the data were collected using a short-term longitudinal study, limited causality could be met. However, we suggest a more extended longitudinal design is necessary to prove a causal relationship between time points. Third, all variables in this study come from one source (students) and are self-reported, which may have common method bias problems (Podsakoff, MacKenzie, and Podsakoff 2012). We suggest future studies using a mixed methods approach and data from multiple sources (students and teachers).

### **Conclusion**

<sup>1</sup> During the COVID-19 pandemic, the phenomenon <sup>4</sup> of loneliness has attracted the attention of many researchers. This study evaluates the consistency between times of loneliness, burnout, and social effect, the differences in the three measurements based on gender, and the detrimental effects of loneliness on burnout and social self-efficacy of students at two Islamic state universities. The results showed that loneliness and burnout at one point in time could consistently predict loneliness and burnout in the future. Furthermore, gender does not seem to be a potential predictor of loneliness, burnout, and social self-efficacy. The study's results only found differences in scores in two time periods: loneliness T2 and burnout T2. Finally, this study finds the effect of cross-lag loneliness on burnout and the temporary effect of loneliness on social and <sup>2</sup> social self-efficacy. The results of this study <sup>2</sup> indicate a positive effect of loneliness on burnout and a negative effect on social self-efficacy. Although the research findings show the effect of temporary loneliness on social self-efficacy, at least the direction is still in line with the initial assumption that high loneliness will reduce social self-efficacy in students. Along with the transition of the learning process from online mode to blended mode, some students have returned to learning in face-to-face mode. These conditions increase opportunities for social interaction, improving students' social skills.

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## Evaluation of Loneliness, Social Self-efficacy, and Burnout Relationship among Islamic University Students

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### Abstract

This study examines the impact of loneliness-related online learning on students during emergency remote teaching. Specifically, this study aims to: (1) evaluate the consistency between times of loneliness, burnout, and social self-efficacy, (2) examine the differences in the three measurements based on gender, and (3) examine the detrimental effects of loneliness on burnout and social self-efficacy of students at two Islamic state universities. Using a short-term longitudinal study design involving 237 students from two state Islamic universities. Data were analyzed using descriptive, comparative, correlation, and regression to test the proposed model. The results showed that loneliness and burnout at one point in time could consistently predict loneliness and burnout in the future. The comparative test results found differences in loneliness, burnout, and social self-efficacy based on gender, giving mixed results: significant differences were only found in loneliness (T2) and burnout (T2). Finally, there was no significant difference in social self-efficacy between male and female students at the two-time points.

**Keywords:** Islamic University, Loneliness and Burnout Relationship, Muslim Students, Online Learning, Social Self-efficacy

### Introduction

In March 2020, the Indonesian government declared a coronavirus disease (COVID-19) emergency. Several preventive measures were taken, including imposing social distancing, closing locations and crowd centers, and moving student learning activities to emergency remote teaching (ERT). Despite the various barriers to ERT learning (e.g., connectivity and technological obstacles) that are experienced in almost all countries, there is also an increasing trend of connection crises and loneliness epidemics.<sup>1</sup> A high level of

<sup>1</sup> Deborah J. Cohan, "The Lonely College Student: A Professor's Advice for Students and Parents. Psychology Today," September 24, 2017, <https://www.psychologytoday.com/us/blog/social-lights/201709/the-lonely->

loneliness among students raises new concerns, especially regarding the long-term psychological development of students. Although online learning has various advantages, especially regarding flexibility, the lack of direct social interaction leads to high reports of loneliness experienced by students in various countries.<sup>2</sup> In Indonesia, a study reported that the phenomenon of loneliness in students had caused a decrease in student engagement and academic achievement during ERT.<sup>3</sup> In response to Mizani et al. to explore the continued effects of loneliness on student learning behavior, the current study tries to provide new insights regarding the relationship between students' loneliness, burnout, and social self-efficacy in transitioning of ERT to blinded mode.

Existing studies have documented that loneliness-related COVID-19 experienced by students has a detrimental effect on students' attitudes and behavior. Loneliness effectively predicts mental health and well-being,<sup>4</sup> reducing student engagement,<sup>5</sup> and decreasing

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college-student; Renee Kaufmann and Jessalyn I Vallade, "Exploring Connections in the Online Learning Environment: Student Perceptions of Rapport, Climate, and Loneliness," *Interactive Learning Environments*, April 10, 2020, 1–15, <https://doi.org/10.1080/10494820.2020.1749670>.

<sup>2</sup> Leodoro J. Labrague and Janet Alexis De los Santos, "Association between Nurse and Hospital Characteristics and Organisational Silence Behaviours in Nurses: A Cross-sectional Study," *Journal of Nursing Management* 28, no. 8 (November 10, 2020): 2196–2204, <https://doi.org/10.1111/jonm.13101>; Antonia M Werner et al., "The Impact of Lockdown Stress and Loneliness during the COVID-19 Pandemic on Mental Health among University Students in Germany," *Scientific Reports* 11, no. 1 (2021): 22637, <https://doi.org/10.1038/s41598-021-02024-5>; Michelle Haikalis et al., "Changes in College Student Anxiety and Depression From Pre- to During-COVID-19: Perceived Stress, Academic Challenges, Loneliness, and Positive Perceptions," *Emerging Adulthood* 10, no. 2 (2022): 534–45, <https://doi.org/10.1177/21676968211058516>; Joanna E. McHugh Power et al., "Loneliness and Social Engagement in Older Adults: A Bivariate Dual Change Score Analysis," *Psychology and Aging* 34, no. 1 (2019): 152–62, <https://psycnet.apa.org/doi/10.1037/pag0000287>.

<sup>3</sup> Hilmi Mizani et al., "Loneliness, Student Engagement, and Academic Achievement during Emergency Remote Teaching during COVID-19: The Role of the God Locus of Control," *Humanities and Social Sciences Communications* 9, no. 1 (September 9, 2022): 305, <https://doi.org/10.1057/s41599-022-01328-9>.

<sup>4</sup> Elisabeth Diehl et al., "Burdens, Resources, Health and Wellbeing of Nurses Working in General and Specialised Palliative Care in Germany – Results of a Nationwide Cross-Sectional Survey Study," *BMC Nursing* 20, no. 1 (2021): 162, <https://doi.org/10.1186/s12912-021-00687-z>; Kaufmann and Vallade, "Exploring Connections in the Online Learning Environment: Student Perceptions of Rapport, Climate, and Loneliness"; Jianfen Wu, Yunpeng Wu, and Yu Tian, "Temporal Associations among Loneliness, Anxiety, and Depression during the COVID-19 Pandemic Period," *Stress and Health* 38, no. 1 (February 7, 2022): 90–101, <https://doi.org/10.1002/smi.3076>; Haikalis et al., "Changes in College Student Anxiety and Depression From Pre- to During-COVID-19: Perceived Stress, Academic Challenges, Loneliness, and Positive Perceptions"; Christopher J. Mehus et al., "Association between COVID-19-Related Loneliness or Worry and Symptoms of Anxiety and Depression among First-Year College Students," *Journal of American College Health*, July 9, 2021, 1–6, <https://doi.org/10.1080/07448481.2021.1942009>.

<sup>5</sup> Mizani et al., "Loneliness, Student Engagement, and Academic Achievement during Emergency Remote Teaching during COVID-19: The Role of the God Locus of Control"; Elena Rolandi et al., "Loneliness and Social Engagement in Older Adults Based in Lombardy during the Covid-19 Lockdown: The Long-Term Effects of a Course on Social Networking Sites Use," *International Journal of Environmental Research and Public Health* 17, no. 21 (2020): 1–12, <https://doi.org/10.3390/ijerph17217912>.

academic achievement.<sup>6</sup> In addition, a high level of loneliness is also associated with increased burnout<sup>7</sup> and decreased students' social self-efficacy.<sup>8</sup>

The present study evaluates differences in loneliness, burnout, and social self-efficacy based on gender as the first goal. In particular, this study wanted to validate these differences by gender, which previously had mixed results. For example, some studies report that female students have higher levels of burnout than boys,<sup>9</sup> but other studies report otherwise.<sup>10</sup> On the other hand, burnout is said to be closely related to culture,<sup>11</sup> so differences in results may occur. In the same vein, different results were also found to be related to differences in levels of self-efficacy by gender. Several studies reported that male students had higher self-

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<sup>6</sup> Lata Bajpai Singh, Alok Kumar, and Shalini Srivastava, "Academic Burnout and Student Engagement: A Moderated Mediation Model of Internal Locus of Control and Loneliness," *Journal of International Education in Business* 14, no. 2 (September 21, 2021): 219–39, <https://doi.org/10.1108/JIEB-03-2020-0020>; Mizani et al., "Loneliness, Student Engagement, and Academic Achievement during Emergency Remote Teaching during COVID-19: The Role of the God Locus of Control"; İlimdar Yalçın et al., "Effect of Smartphone Addiction on Loneliness Levels and Academic Achievement of z Generation," *International Journal of Psychology and Educational Studies* 7, no. 1 (2020): 208–14, <https://doi.org/10.17220/ijpes.2020.01.017>.

<sup>7</sup> Ivan P. Gradiski et al., "Burnout in International Medical Students: Characterization of Professionalism and Loneliness as Predictive Factors of Burnout," *International Journal of Environmental Research and Public Health* 19, no. 3 (January 26, 2022): 1385, <https://doi.org/10.3390/ijerph19031385>; Singh, Kumar, and Srivastava, "Academic Burnout and Student Engagement: A Moderated Mediation Model of Internal Locus of Control and Loneliness"; Huseyin Arasli, Boshra Hejratty Namin, and A. Mohammed Abubakar, "Workplace Incivility as a Moderator of the Relationships between Polychronicity and Job Outcomes," *International Journal of Contemporary Hospitality Management* 30, no. 3 (March 19, 2018): 1245–72, <https://doi.org/10.1108/IJCHM-12-2016-0655>.

<sup>8</sup> Christine M. Wickens et al., "Loneliness in the COVID-19 Pandemic: Associations with Age, Gender and Their Interaction," *Journal of Psychiatric Research* 136 (April 2021): 103–8, <https://doi.org/10.1016/j.jpsychires.2021.01.047>; Stephanie T. Child and Leora Lawton, "Loneliness and Social Isolation among Young and Late Middle-Age Adults: Associations with Personal Networks and Social Participation," *Aging & Mental Health* 23, no. 2 (February 24, 2019): 196–204, <https://doi.org/10.1080/13607863.2017.1399345>.

<sup>9</sup> Julia Herrmann, Karoline Koeppen, and Ursula Kessels, "Do Girls Take School Too Seriously? Investigating Gender Differences in School Burnout from a Self-Worth Perspective," *Learning and Individual Differences* 69 (January 2019): 150–61, <https://doi.org/10.1016/j.lindif.2018.11.011>; Brett Worly et al., "Burnout, Perceived Stress, and Empathic Concern: Differences in Female and Male Millennial Medical Students," *Psychology, Health & Medicine* 24, no. 4 (April 21, 2019): 429–38, <https://doi.org/10.1080/13548506.2018.1529329>; Katherine J. Gold et al., "Gender Differences in Stress and Burnout: Department Survey of Academic Family Physicians," *Journal of General Internal Medicine* 36, no. 6 (June 26, 2021): 1811–13, <https://doi.org/10.1007/s11606-020-06287-y>; Sigalit Warshawski, "Academic Self-Efficacy, Resilience and Social Support among First-Year Israeli Nursing Students Learning in Online Environments during COVID-19 Pandemic," *Nurse Education Today* 110 (March 2022): 105267, <https://doi.org/10.1016/j.nedt.2022.105267>.

<sup>10</sup> Zhun Gong et al., "Does Resilience Help in Reducing Burnout Symptoms Among Chinese Students? A Meta-Analysis," *Frontiers in Psychology* 12 (August 17, 2021), <https://doi.org/10.3389/fpsyg.2021.707792>.

<sup>11</sup> Wilmar B. Schaufeli, "Past Performance and Future Perspectives of Burnout Research," *SA Journal of Industrial Psychology* 29, no. 4 (January 1, 2003): 1–15, <https://doi.org/10.10520/EJC88982>; Andrew Molodynski et al., "Cultural Variations in Wellbeing, Burnout and Substance Use amongst Medical Students in Twelve Countries," *International Review of Psychiatry* 33, no. 1–2 (February 17, 2021): 37–42, <https://doi.org/10.1080/09540261.2020.1738064>.

efficacy than female students,<sup>12</sup> and others said gender did not affect self-efficacy.<sup>13</sup> Accordingly, the study will examine differences in loneliness, burnout, and social self-efficacy based on gender as the first goal.

Furthermore, the second objective of the present study is to examine the relationship between loneliness, burnout, and social self-efficacy. Although various studies have proven the relationship between these three variables, two main limitations in previous studies must be addressed: the placement of interchangeable variables. For example, Singh et al.<sup>14</sup> and Kloutsiniotis et al.<sup>15</sup> place burnout as a predictor of loneliness. In contrast, Gradiski et al. suggest that loneliness is a factor that affects burnout.<sup>16</sup> Second, this study responds to the call of previous studies to clarify the temporary effect of loneliness on self-efficacy.<sup>17</sup> Feldman et al. found that the impact of loneliness on self-efficacy is temporary and only significant if the two are measured in a relatively close time. In addition, Andretta and McKay only focus on loneliness, measured at two-time points, while social self-efficacy is measured at one time. The present study re-examines loneliness and social self-efficacy using two different time points. This study was developed more broadly by examining the effects of loneliness on burnout, which were not previously carried out by Andretta and McKay and Feldman et al., using a short-longitudinal data design. Thus, the present study investigated these associations over time.

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<sup>12</sup> Warshawski, "Academic Self-Efficacy, Resilience and Social Support among First-Year Israeli Nursing Students Learning in Online Environments during COVID-19 Pandemic"; Inmaculada Alemany-Arrebola et al., "Influence of COVID-19 on the Perception of Academic Self-Efficacy, State Anxiety, and Trait Anxiety in College Students," *Frontiers in Psychology* 11 (October 9, 2020), <https://doi.org/10.3389/fpsyg.2020.570017>; James R. Andretta and Michael T. McKay, "The Influence of Loneliness on Academic, Social, and Emotional Self-Efficacy in Early Adolescence: A Twelve Month Follow-up Study," *Clinical and Medical Pediatrics* 1, no. 1 (2018), <https://doi.org/10.15761/CMP.1000105>.

<sup>13</sup> Carlos Salavera, Pablo Usán, and Laurane Jarie, "Emotional Intelligence and Social Skills on Self-efficacy in Secondary Education Students. Are There Gender Differences?," *Journal of Adolescence* 60, no. 1 (October 24, 2017): 39–46, <https://doi.org/10.1016/j.adolescence.2017.07.009>; Vanesa Salado et al., "Study of the Psychometric Properties of the Social Self-Efficacy Scale with Spanish Adolescents by Gender, Age and Family Socioeconomic Level," *Healthcare* 10, no. 6 (June 20, 2022): 1150, <https://doi.org/10.3390/healthcare10061150>.

<sup>14</sup> Singh, Kumar, and Srivastava, "Academic Burnout and Student Engagement: A Moderated Mediation Model of Internal Locus of Control and Loneliness."

<sup>15</sup> Panagiotis V. Kloutsiniotis et al., "Transformational Leadership, HRM Practices and Burnout during the COVID-19 Pandemic: The Role of Personal Stress, Anxiety, and Workplace Loneliness," *International Journal of Hospitality Management* 102 (April 2022): 103177, <https://doi.org/10.1016/j.ijhm.2022.103177>.

<sup>16</sup> Gradiski et al., "Burnout in International Medical Students: Characterization of Professionalism and Loneliness as Predictive Factors of Burnout."

<sup>17</sup> Wu, Wu, and Tian, "Temporal Associations among Loneliness, Anxiety, and Depression during the COVID-19 Pandemic Period"; David B. Feldman et al., "Hope as a Mediator of Loneliness and Academic Self-Efficacy Among Students With and Without Learning Disabilities during the Transition to College," *Learning Disabilities Research & Practice* 31, no. 2 (May 2016): 63–74, <https://doi.org/10.1111/ldrp.12094>; Andretta and McKay, "The Influence of Loneliness on Academic, Social, and Emotional Self-Efficacy in Early Adolescence: A Twelve Month Follow-up Study."

In short, the present study investigates three questions. First, the present study examines the consistency between times of loneliness, burnout, and social self-efficacy in two independent sample students at two state Islamic universities across six months. These results support the internal validity and consistency of measurements across time on the three constructs studied. Secondly, examine differences in loneliness, burnout, and social self-efficacy by gender. Finally, it examined the effect of loneliness on burnout and social self-efficacy. Following Mizani et al., a present study uses the Cacioppo Evolutionary Theory of Loneliness (ETL) to explain loneliness's short- and long-term effects on burnout and social self-efficacy.<sup>18</sup> This study proposes that loneliness has a positive impact on burnout and a negative effect on social self-efficacy. These findings provide new insights regarding the temporary and long-term effects of student loneliness on learning-related behavior, especially during the transition from online to blended learning.

## **Methods**

### **Participants and procedures.**

The research sample used a purposive method involving two Islamic public universities willing to collaborate in data collection. Data collection uses a short-term longitudinal study approach where data collection is carried out at two different time points. The first stage is the end of the semester (April 2022), where students are asked to answer questions about loneliness, burnout, and social self-efficacy. The second data collection stage was carried out at the beginning of the next semester (September 2022). Students were invited to answer questions about loneliness, burnout, and social self-efficacy. A total of 342 students voluntarily filled out the questionnaire, and after eliminating incomplete data, 237 respondents were used as the final data. The respondents comprised 68.4 percent of females student and 31.6 percent of males. Most respondents (86.9 percent) are unemployed, and only 13.1 percent are already employed. Furthermore, most respondents were first-year students (51.9 percent), and 46.4 percent were second-year students.

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<sup>18</sup> John T Cacioppo and Stephanie Cacioppo, "Chapter Three - Loneliness in the Modern Age: An Evolutionary Theory of Loneliness (ETL)," ed. James M B T - *Advances in Experimental Social Psychology* Olson, vol. 58 (Academic Press, 2018), 127–97, <https://doi.org/10.1016/bs.aesp.2018.03.003>.

**Table 1.** Characteristics of Respondents

Characteristics	n	Percent
Gender		
Male	75	31.6
Female	162	68.4
Employment status		
Unemployed	206	86.9
Employed	31	13.1
Grade		
1 <sup>st</sup> grade	123	51.9
2 <sup>nd</sup> grade	110	46.4
3 <sup>rd</sup> grade	4	1.7

## Measurement

The measurement model for all variables was adapted from previous research. Loneliness adapted from Hays and DiMatteo.<sup>19</sup> Examples of items are, 'I do not have close friends and 'people are around me, but not with me.' Respondents were asked to give a rating of 1 = strongly disagree to 5 = strongly agree. High scores indicate high perceived loneliness in students.

Academic burnout was measured by the exhaustion subscale from the Maslach Burnout Inventory–Student.<sup>20</sup> This subscale is considered the most representative measure of burnout.<sup>21</sup> Examples are "I feel emotionally drained by my studies" and "I feel tired after taking online classes." Respondents were asked to give a rating of 1 = strongly disagree to 5 = strongly agree. High scores indicate a high level of burnout.

Social self-efficacy was adapted from 3 items developed by Kim et al.<sup>22</sup> Examples of items are "I can express my opinion well when friends/classmates have different thoughts from mine" and "I can work well with classmates on group projects." Respondents were asked to give a rating of 1 = strongly disagree to 5 = strongly agree. High scores indicate high social self-efficacy.

<sup>19</sup> Ron D Hays and M Robin DiMatteo, "A Short-Form Measure of Loneliness," *Journal of Personality Assessment* 51, no. 1 (March 1, 1987): 69–81, [https://doi.org/10.1207/s15327752jpa5101\\_6](https://doi.org/10.1207/s15327752jpa5101_6).

<sup>20</sup> Wilmar B. Schaufeli et al., "Burnout and Engagement in University Students: A Cross-National Study," *Journal of Cross-Cultural Psychology* 33, no. 5 (September 1, 2002): 464–81, <https://doi.org/10.1177/0022022102033005003>.

<sup>21</sup> Edgar Bresó, Marisa Salanova, and Wilmar B. Schaufeli, "In Search of the 'Third Dimension' of Burnout: Efficacy or Inefficacy?," *Applied Psychology* 56, no. 3 (July 2007): 460–78, <https://doi.org/10.1111/j.1464-0597.2007.00290.x>.

<sup>22</sup> Yonghwan Kim et al., "Social Media and Life Satisfaction among College Students: A Moderated Mediation Model of SNS Communication Network Heterogeneity and Social Self-Efficacy on Satisfaction with Campus Life," *The Social Science Journal* 57, no. 1 (January 2, 2020): 85–100, <https://doi.org/10.1016/j.soscij.2018.12.001>.

**Table 2.** The Evaluation of the Measurement Model

Construct	Indicator	Factor Loading	Cronbach Alpha
Loneliness	lon1	.700	0.805
	lon2	.555	
	lon3	.241	
	lon4	.792	
	lon5	.819	
	lon6	.540	
	lon7	.526	
	lon8	.642	
Academic Burnout	burn1	.743	0.817
	burn2	.744	
	burn3	.750	
	burn4	.759	
	burn5	.807	
Social Self-Efficacy	sse1	.740	0.762
	sse2	.796	
	sse3	.730	

The results of the validity test showed that one item (lon3) in the loneliness construct is invalid (factor loading < 0.50), so it is eliminated from the measurement model.<sup>23</sup> In contrast, all other items are declared valid. Furthermore, the reliability test results with the Cronbach alpha coefficient showed that all constructs already had good internal consistency (CA > 0.70).<sup>24</sup> Thus, the full scale used in this study has met the validity and reliability.

### Analysis technique

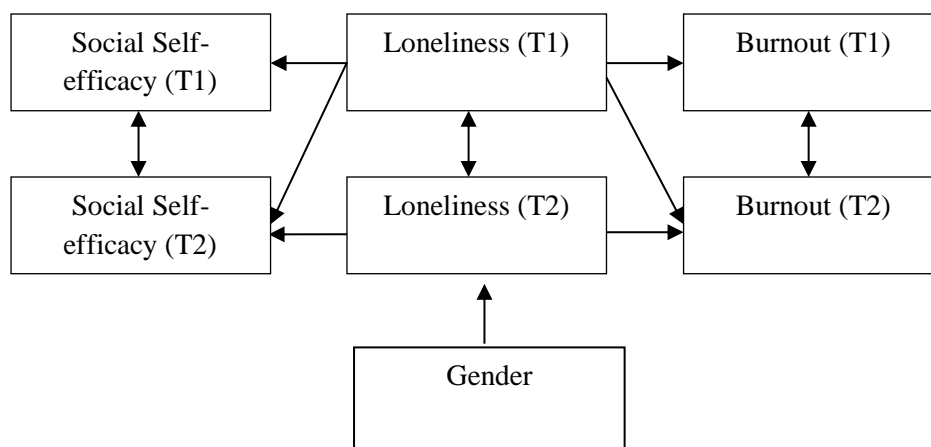
This study uses several stages of analysis. Previous studies applied comparative, correlation, and regression test techniques.<sup>25</sup> A comparative test was conducted to examine differences in loneliness, burnout, and social self-efficacy based on gender. Next, correlation analysis is used to test the relationship between variables. Finally, a linear curve was applied to examine the relationship between loneliness, burnout, and social self-efficacy based on time points (see Figure 1). Considering the large sample size (more than ten observations per variable), testing the assumption of normality in the data is unnecessary. The large

<sup>23</sup> Joe Hair et al., *Multivariate Data Analysis*, 7th ed. (Prentice Hall, Upper Saddle River, NJ, 2010).

<sup>24</sup> Jum C. Nunnally and Ira H. Bernstein, *Psychometric Theory* (New York: Oxford Univer, 1994).

<sup>25</sup> Feldman et al., "Hope as a Mediator of Loneliness and Academic Self-Efficacy Among Students With and Without Learning Disabilities during the Transition to College"; William Tsai, Kenneth T Wang, and Meifen Wei, "Reciprocal Relations between Social Self-Efficacy and Loneliness among Chinese International Students.," *Asian American Journal of Psychology* 8, no. 2 (2017): 94–102, <https://doi.org/10.1037/aap0000065>.

sample size is robust from violations of the normality assumption for linear regression and another parametric test.<sup>26</sup>



**Figure 1.** Research model

Figure 1 displays the research model tested in this study. In line with the technical analysis procedures, firstly, this study aims to examine differences in loneliness, burnout, and social self-efficacy based on gender. Furthermore, construct correlations between periods 1 and 2 are estimated to measure the consistency of the levels of loneliness, burnout, and social self-efficacy. Finally, regression was applied to examine the effects of loneliness on burnout and social self-efficacy by combining the effects across the observation period.

## Discussion

### Descriptive Statistics and Consistency Between Time 1 and 2

The first stage of the analysis displays a description of the data, as presented in Table 1. The results show the distribution of loneliness, burnout, and social self-efficacy scores at two different times. The loneliness score at T1 is 2,828, slightly smaller than the score at T2 is 3,149. For burnout, T1 scored 2,389, relatively the same as T2 ( $M = 2,369$ ). The social self-efficacy score at T1 was 3,561, and T2 was slightly higher at 3,924. The results of this initial description indicate that the score invariance on the three constructs is relatively stable for burnout and social self-efficacy. At the same time, in loneliness, there is an increase in scores between T1 to T2. The correlation between time points also shows that loneliness on

<sup>26</sup> Amand F. Schmidt and Chris Finan, "Linear Regression and the Normality Assumption," *Journal of Clinical Epidemiology* 98 (June 2018): 146–51, <https://doi.org/10.1016/j.jclinepi.2017.12.006>; Asghar Ghasemi and Saleh Zahediasl, "Normality Tests for Statistical Analysis: A Guide for Non-Statisticians," *International Journal of Endocrinology and Metabolism* 10, no. 2 (December 1, 2012): 486–89, <https://doi.org/10.5812/ijem.3505>.



T1 is correlated with T2 of 0.608. The correlation between burnout (T1 and T2) is 0.610, and social self-efficacy (T1 and T2) is 0.199. These correlations are in the positive direction, indicating a stable relationship over time.

**Table 2.** Descriptive Statistics and Relations Between Time 1 and Time 2 Measures

No.	Construct	Mean	SE	1	2	3	4	5	6
1	Burnout (T1)	2.828	.691	1					
2	Burnout (T2)	3.149	1.029	.608	1				
3	Lone (T1)	2.389	.821	.469	.330	1			
4	Lone (T2)	2.369	.853	.267	.160	.610	1		
5	SSE (T1)	3.620	.974	-.179	-.080	-.228	-.073	1	
6	SSE (T2)	3.924	.855	-.162	-.240	-.127	-.187	.199	1

The study's results confirm a positive relationship between time one and time two on all scales tested. The effect of loneliness from time 1 to time 2 is positive 0.610, indicating that students who reported loneliness at time 1 were relatively consistent with loneliness six months later (time 2). These results align with Feldman et al., who found a positive and stable effect over time on student loneliness. Burnout time one was also shown to significantly affect burnout time 2, indicating that students who reported burnout at time 1 were consistent with the level of burnout time 2. While social self-efficacy time 1 had a weak positive effect on self-efficacy time 2. These results provide information that there are reports of students with relatively inconsistent social self-efficacy where the change in online learning mode at time 1 to blinded time two is corrected. The higher level of social self-efficacy at time two may be due to social interaction in learning activities, where most students have run the face-to-face learning mode. Thus it is logical if there is a change in students' attitudes toward social self-efficacy and an increase in direct social interaction. In other words, the pandemic may have affected perceived social self-efficacy due to social restrictions due to government policies limiting all activities, including education.<sup>27</sup>

### The Gender Differences

The analysis results on differences in the mean scores of loneliness, burnout, and social self-efficacy observed based on gender are shown in Table 3. First, the test results of the mean score for loneliness (T1) are not significantly different between men and women (sig > 0.05). However, for T2, the mean score between males and females was significantly

<sup>27</sup> Wickens et al., "Loneliness in the COVID-19 Pandemic: Associations with Age, Gender and Their Interaction"; Child and Lawton, "Loneliness and Social Isolation among Young and Late Middle-Age Adults: Associations with Personal Networks and Social Participation."

different (Sig 0.004 < 0.05). Second, burnout at T1 was not significantly different base on gender; however, at T2, the scores were significantly different (Sig 0.029 < 0.05). Third, social self-efficacy for T1 is insignificant different among male and female students for T1 and T2.

**Table 3.** Differences in Mean Scores by Gender

Construct	Gender	N	Mean	Mean Difference	F	Sig.	t
lone1	Male	75	2.776	-0.076	5.074	0.433	-0.785
	Female	162	2.852				
lone2	Male	75	2.870	-0.408	0.187	0.004	-2.881
	Female	162	3.278				
burn1	Male	75	2.472	0.121	5.384	0.290	1.059
	Female	162	2.351				
burn2	Male	75	2.547	0.260	1.793	0.029	2.197
	Female	162	2.287				
sse1	Male	75	3.800	0.165	0.751	0.225	1.218
	Female	162	3.451				
sse2	Male	75	3.920	0.006	2.610	0.961	-0.052
	Female	162	3.926				

The analysis results show that the measurement of loneliness for men and women is relatively the same at T1. However, the scores differ at T2, where the mean score for female respondents is higher than for male students. For burnout, male and female students are relatively the same at T1, but at T2, the mean score for males is relatively higher than for females. Finally, social self-efficacy at T1 was insignificant different for T1 and T2. According to the situation, the difference in mean scores seems very susceptible to change. However, these results indicate that female respondents reported higher levels of loneliness than males at T1 and T2. As for burnout, male respondents consistently reported higher levels of burnout than females for T1 and T2. Meanwhile, for social self-efficacy, male respondents reported higher scores at T1 and vice versa for T2.

The study's results revealed mixed findings; loneliness T1 reported by male and female students was relatively the same. At the same time, at T2, there was a significant difference between male and female students. As expected, women reported higher levels of loneliness than men, thus supporting previous findings.<sup>28</sup> The difference in loneliness scores

<sup>28</sup> Wickens et al., "Loneliness in the COVID-19 Pandemic: Associations with Age, Gender and Their Interaction"; Manuela Barreto et al., "Loneliness around the World: Age, Gender, and Cultural Differences in Loneliness," *Personality and Individual Differences* 169 (2021): 110066, <https://doi.org/10.1016/j.paid.2020.110066>; Huijun Liu et al., "Gender Differences in the Influence of Social Isolation and Loneliness on Depressive Symptoms in College Students: A Longitudinal Study," *Social*

between male and female students is because, in general, women prefer participation and interaction activities and are more sensitive to interpersonal relationships than men.<sup>29</sup> Consequently, when social activity is restricted, women will report higher levels of loneliness than their male counterparts.

Furthermore, this study's results also revealed no significant difference in T1 burnout between women and men. However, on T2, the burnout of male students was relatively higher than that of women. This result contrasts previous studies,<sup>30</sup> which reported higher burnout in female students than their male counterparts. However, this study is in line with other findings that reported higher burnout in men than women.<sup>31</sup> This difference is considered reasonable, considering that burnout is closely related to culture,<sup>32</sup> so differences in results may occur. Thus, based on existing literature, studies conducted in Europe and America tend to report higher burnout in women, while those in Asia report the opposite result.

Regarding social self-efficacy, this study revealed no difference between men and women at T1 and T2, indicating that both male and female students reported the same level of self-efficacy. The results of this study differ from previous findings,<sup>33</sup> which reported that male students had higher self-efficacy than female students. However, referring to several other studies,<sup>34</sup> gender does not have a bias on self-efficacy. This difference again shows that social self-efficacy, an individual's belief in their social abilities, is highly dependent on

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*Psychiatry and Psychiatric Epidemiology* 55, no. 2 (February 21, 2020): 251–57, <https://doi.org/10.1007/s00127-019-01726-6>.

<sup>29</sup> Barreto et al., “Loneliness around the World: Age, Gender, and Cultural Differences in Loneliness”; Liu et al., “Gender Differences in the Influence of Social Isolation and Loneliness on Depressive Symptoms in College Students: A Longitudinal Study.”

<sup>30</sup> Herrmann, Koeppen, and Kessels, “Do Girls Take School Too Seriously? Investigating Gender Differences in School Burnout from a Self-Worth Perspective”; Worly et al., “Burnout, Perceived Stress, and Empathic Concern: Differences in Female and Male Millennial Medical Students”; Gold et al., “Gender Differences in Stress and Burnout: Department Survey of Academic Family Physicians”; Warshawski, “Academic Self-Efficacy, Resilience and Social Support among First-Year Israeli Nursing Students Learning in Online Environments during COVID-19 Pandemic.”

<sup>31</sup> Gong et al., “Does Resilience Help in Reducing Burnout Symptoms Among Chinese Students? A Meta-Analysis.”

<sup>32</sup> Schaufeli, “Past Performance and Future Perspectives of Burnout Research”; Molodynski et al., “Cultural Variations in Wellbeing, Burnout and Substance Use amongst Medical Students in Twelve Countries.”

<sup>33</sup> Warshawski, “Academic Self-Efficacy, Resilience and Social Support among First-Year Israeli Nursing Students Learning in Online Environments during COVID-19 Pandemic”; Alemany-Arrebola et al., “Influence of COVID-19 on the Perception of Academic Self-Efficacy, State Anxiety, and Trait Anxiety in College Students”; Andretta and McKay, “The Influence of Loneliness on Academic, Social, and Emotional Self-Efficacy in Early Adolescence: A Twelve Month Follow-up Study.”

<sup>34</sup> Salavera, Usán, and Jarie, “Emotional Intelligence and Social Skills on Self-efficacy in Secondary Education Students. Are There Gender Differences?”; Salado et al., “Study of the Psychometric Properties of the Social Self-Efficacy Scale with Spanish Adolescents by Gender, Age and Family Socioeconomic Level.”

the situation where this study was conducted during the transition from remote teaching to blended learning.

### The Regression Analysis

Regression in the basic model is used to evaluate the causal relationship of loneliness to burnout and social self-efficacy. The analysis results show that four relationships have been successfully proven: loneliness (T1) significantly affecting burnout (T1 and T2). Furthermore, loneliness (T1) significantly affects social self-efficacy (T1) but not significantly on self-efficacy (T2). Loneliness (T2) significantly affects social self-efficacy (T2). In contrast to the initial assumption, loneliness (T1) does not significantly affect social self-efficacy (T2). In addition, loneliness (T2) also does not significantly affect burnout (T2).

**Table 4.** Model Analysis

Model	$\beta$	SE	t	Sig
Lone (T1) -> Burnout (T1)	0.464	0.059	7.981	0.000
Lone (T1) -> Burnout (T2)	0.367	0.089	4.186	0.000
Lone (T1) -> SSE (T1)	-0.228	0.072	3.191	0.002
Lone (T1) -> SSE (T2)	-0.020	0.088	0.233	0.815
Lone (T2) -> Burnout (T2)	-0.065	0.091	0.758	0.449
Lone (T2) -> SSE (T2)	-0.174	0.084	2.075	0.038

The findings suggest that loneliness time significantly affects burnout (T1 and T2) and social self-efficacy (T1). Thus, students who reported high loneliness at Time 1 tended to have high burnout simultaneously (T1) and the following six months (T2). Correspondingly, significant results were also found on the effect of loneliness T2 on T2's social self-efficacy. However, there was no significant effect of T1 loneliness on social self-efficacy Time 2. This finding illustrates that students who reported high loneliness at the T1 only significantly affected the decrease in social self-efficacy simultaneously (T1). However, the relationship was insignificant for the next six months (T2). The relationship between loneliness and self-efficacy appears to be a temporary and short-term relationship.<sup>35</sup> Similar results were also found by Wu et al., who found a short-term relationship between loneliness and mental health (anxiety, depression, and self-esteem). Feldman et al. also found a short-term effect of loneliness on self-efficacy, where the two were significantly related when measured simultaneously.

<sup>35</sup> Wu, Wu, and Tian, "Temporal Associations among Loneliness, Anxiety, and Depression during the COVID-19 Pandemic Period"; Feldman et al., "Hope as a Mediator of Loneliness and Academic Self-Efficacy Among Students With and Without Learning Disabilities during the Transition to College."

Meanwhile, the effect of loneliness on burnout is relatively stable even though it is measured in two different time points, indicating that loneliness is a dominant predictor of burnout in the short and long term. The results of this study provide new knowledge regarding the effects of loneliness on student behavior. Moreover, the results of this study strongly support the temporary impact of loneliness on social self-efficacy but are relatively stable for burnout.

The results of this study offer several important implications for higher education institution managers. First, the findings find that loneliness has a short-term effect on academic burnout and social self-efficacy. Even though it is only temporary, the issue of loneliness needs to be taken more seriously, especially in online learning mode, which has limited direct social interaction. Schools in Indonesia need to be more sensitive to the problem of loneliness, especially for students who have decreased interest in learning. Therefore, teaching staff must be trained to provide more significant concern for students. Second, universities must design online learning modes that can activate social interaction between students. For this reason, teachers can be trained to use various media and tools to maximize interaction and discussion in online classes.

## **Conclusion**

During the COVID-19 pandemic, the phenomenon of loneliness has attracted the attention of many researchers. This study evaluates the consistency between times of loneliness, burnout, and social effect, the differences in the three measurements based on gender, and the detrimental effects of loneliness on burnout and social self-efficacy of students at two Islamic state universities. The results showed that loneliness and burnout at one point in time could consistently predict loneliness and burnout in the future. Furthermore, gender gives mixed results: significant differences have been found in loneliness (T2) and burnout (T2). Finally, this study finds the effect of cross-lag loneliness on burnout and the temporary impact of loneliness on social and social self-efficacy. The results of this study indicate a positive impact of loneliness on burnout and a negative effect on social self-efficacy. Although the research findings show the impact of temporary loneliness on social self-efficacy, at least the direction is still in line with the initial assumption that high loneliness will reduce social self-efficacy in students. Along with the transition of the learning process from online mode to blended mode, some students have

returned to learning face-to-face. These conditions increase opportunities for social interaction, improving students' social skills

This study has limitations that need future research attention. First, data were collected at two similar Islamic universities so that they were not representative of students from private universities. Thus, future studies need to expand the study area to various universities, combining private and public universities to strengthen generalizations. Second, although the data were collected using a short-term longitudinal study, limited causality could be met. However, this study suggests that a more extended longitudinal design is necessary to prove a causal relationship between time points. Third, all variables in this study come from one source (students) and are self-reported, which may have common method bias problems<sup>36</sup>. Moreover, future studies are recommended using a mixed methods approach and data from multiple sources (students and teachers).

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