

JOB BURNOUT AND SATISFACTION AMONG SECONDARY TEACHERS: REGRESSION AND K-MEANS CLUSTERING ANALYSIS

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Abstract

Burnout on a teaching job refers to exhaustion that leads to depression which can affect the teacher's well-being and satisfaction. This article looks into the level of job burnout and satisfaction of high school teachers during modular distance learning and determines its association at different levels. Cross-sectional primary data were gathered from a random sample of secondary teachers in Ormoc City, Leyte, Philippines. The gathered data were job burnout and satisfaction scores and described using standard statistical metrics. Moreover, correlation and regression analysis were employed to analyze its association, and K-means clustering was used to identify homogeneous categories of job burnout and satisfaction scores with similar characteristics. On average, results showed that the high school teachers were still "satisfied" despite the "high burnout" they were facing during the modular distance learning amid the pandemic. Using the correlation analysis, it is revealed that teachers' satisfaction and burnout are significantly and inversely correlated to each other. This implies that the burnout level adversely affects the satisfaction in teaching. Based on regression analysis, there is a decrease of 0.653 units in the satisfaction perception score for every 1 unit increase in the burnout perception score and it is significant at a 1% level. It is depicted in K-means clustering that teachers' satisfaction and burnout levels are compact and converge to the interpretation that they were highly burnout yet satisfied in modular distance learning. Hence, the study suggests that teachers' tasks during distance education must be lessened to increase their well-being as educators.

Keywords: burnout, descriptive-correlational, high school teaching, modular distance education, satisfaction

Introduction

Satisfaction in teaching is a measure of subjective fulfillment or well-being in doing assigned tasks. In the study of Hashim et al. (2020), and Ali and Anwar

(2021), job satisfaction refers to the overall feelings of the workers which signifies their pleasure, work performance, productivity, motivation, and expectations. According to Casinillo et al. (2020), satisfaction in teaching refers to the happiness of what they have accomplished and it is directly related to their productivity in the workplace. During the time of the COVID-19 pandemic, the job satisfaction of teachers was adversely affected and most of them are experiencing unfulfillment due to ineffective forms of learning as face-to-face classes shifted to distance education (Castroverde & Acala, 2021). In addition, teachers' tasks during the new normal were routine in which they were just printing modules for their students and checking their outputs with no physical interaction (Chen et al., 2020). As a result, teachers were facing a high level of burnout in their teaching career during distance learning. Job burnout is defined as physical and emotional exhaustion in their required tasks which results in stress and depression (Rubilar & Oros, 2021). Burnout in teaching adversely affects the well-being of a teacher which results in decreased productivity and satisfaction with their assigned tasks. During the pandemic, teachers are struggling to communicate with their students one by one to monitor their progress and this makes them burn out due to the barriers of distance learning (Sokal et al., 2020). Hence, the teachers' scenario under distance education makes them unsatisfied with their job.

Without face-to-face interaction, teachers and students fall into less satisfactory relationships and seldom engage students in the learning environment. As a result, students are unable to grasp their lessons and cannot finish their required learning tasks which leads to lower academic performance (Casinillo, 2023). With these poor education outcomes, teachers were highly stressed of felt ineffective in their job, which led them to high burnout levels. According to Harmsen et al. (2018), teachers who are dealing with high levels of burnout are more likely to leave their profession and find better jobs outside teaching. In that case, as the teachers face job burnout at a high level, their satisfaction diminishes in their productivity is adversely influenced (Hashim, 2020). In the study of Fakhri et al. (2021), it is mentioned that teachers who were affected by the pandemic have lower satisfaction with their jobs, and the quality of work is negatively affected. Moreover, teachers' perspective in delivering their lessons during distance education seems to be ineffective since they cannot see the academic progress of their students. It is worth noting that the pandemic brought anxiety which is a hindrance to the quality and motivation of both teachers and students in the learning process (Casinillo et al., 2022). In that case, the goal of the educational process and the quality of teaching and learning are not realized due to the barriers of distance education. Hence, some educational researchers were investigating the teachers' satisfaction and burnout levels amid distance education to somehow find a remedy and solve the problem of low performance of students and teachers' well-being concern (Ali & Anwar, 2021; Dicke et al., 2020; Rubilar & Oros, 2021). Dayagbil et al. (2021) portrayed that investigating the scenario of teachers during the pandemic contextualized strategic actions during and beyond the health crisis.

Though the scenario of teachers' satisfaction and burnout levels were well-researched, however, its relationship and classification within clusters have never been investigated amid distance education. Moreover, the investigation of job

satisfaction and burnout of high school teachers during modular distance education in Ormoc City, Leyte, Philippines has never been done. Hence, the researchers were motivated to carry out this current study to fill in the said gap. The main goal of this research study is to characterize the level of teachers' satisfaction and burnout as they faced modular distance learning during the COVID-19 pandemic and explain its relationship at different levels. In specific, the article established an answer to the following objectives: (1) to measure the level of the teachers' satisfaction and burnout during distance education; (2) to model the relationship between teachers' satisfaction and burnout using regression analysis; (3) to constellate the teachers' satisfaction and burnout level into similar characteristics using K-means clustering. The purpose of conducting this study is to understand the teachers' satisfaction and burnout which might be useful for school heads and policymakers to improve the educational system in distance education. The results of this research study may provide some information to reduce the burnout level and enhance the teachers' satisfaction. Furthermore, the findings of this article might be useful as input to educational policy during distance learning and beyond the pandemic to ease unprecedented challenges.

Methods

This study involved a correlational research design that focuses on the relationship between two variables of interest namely the teachers' satisfaction and burnout levels during the distance learning amid the pandemic. The design used determined the degree and direction of association between the two variables which describes the teachers' motivation and struggles in teaching amid distance education. The desired respondents of this study were the secondary teachers in Ormoc City, Leyte, Philippines. Selected National High Schools (NHSs) namely: (1) Margen NHS, (2) Linao NHS, and (3) Valencia NHS were chosen as the schools of interest. The schools were chosen by the researchers since they have the highest turnover rate based on the record of the Ormoc City School Division. Using Slovin's formula with a 5% margin of error, the computed sample size of this study is 132 teachers. The sample size was proportionated to the three schools and simple random sampling was employed so that every teacher within the school has an equal chance of being selected as respondents. Hence, out of 53 teachers in Margen NHS, 36 were selected, out of 66 teachers in Linao NHS, 44 were selected, and out of 80 teachers in Valencia NHS, 52 were selected.

The research instrument involved two parts such as teachers' job satisfaction and burnout level. The teachers' job satisfaction questionnaire was adapted from the paper of Lester (1987) in which the researchers aligned it to the current scenario of modular distance learning. The satisfaction questionnaire involved 20 statements about the teachers' work satisfaction that follows a 5-point rating Likert scale such as follows: Very dissatisfied - 1, Dissatisfied - 2, Neutral - 3, Satisfied - 4, Very satisfied - 5. In determining the satisfaction level, all perception score in each question was summed up. The highest possible satisfaction score is 100 and the lowest is 20. The higher score indicates a higher satisfaction and the lower score indicates a lower satisfaction. Using Cronbach's alpha, the said questionnaire possessed a reliability score of 0.91 which indicates that the set of questions is reliable for use. Table 1 depicts the possible interval satisfaction scores, responses, and verbal interpretation.

Table 1. Teachers' satisfaction perception score, response, and its interpretation

Total satisfaction score	Teachers' response	Interpretation
20 - 36	Strong disagree	Very dissatisfied
37 - 52	Disagree	Dissatisfied
53 - 68	Neutral	Moderately satisfied
69 - 84	Agree	Satisfied
85 - 100	Strong Agree	Very satisfied

The questionnaire for teachers' burnout level was adapted from the instrument Oldenburg Burnout Inventory (OLBI) which captures the job burnout of an employee (Demerouti & Bakker, 2008). This research instrument is composed of sixteen (16) questions that follow a four 4-point Likert scale that includes the following: Strongly Agree -1, Agree - 2, Disagree - 3, and Strongly Disagree - 4. To determine the job burnout level, all burnout perception score in each question was summed up. The highest possible burnout perception score is 64 and the lowest is 16. The higher the score means a higher burnout level and the lower score implies a lower burnout level. Reis et al. (2015) depicted that the OLBI instrument has a reliability score of 0.73 to 0.85 which can be interpreted as a reliable set of questions.

Table 2. Teachers' burnout perception score, teachers' response, and verbal interpretation

Total burnout score	Teachers' response	Interpretation
16 - 28	Strongly agree	Extremely burnout
29 - 40	Agree	Highly burnout
41 - 52	Disagree	Moderately burnout
53 - 64	Strongly disagree	Low burnout

The questionnaire for the teachers' job satisfaction and burnout level was validated and evaluated by the three (3) experts in social science research and portrayed that it captures the experiences and well-being of the high school teachers during modular distance learning. The data were encoded in Excel and formatted for the STATA statistical program for the calculation analysis. In summarizing the data, descriptive metrics were used such as minimum (Min) and maximum (Max) values, mean (M), standard deviation (SD), and scatter plots. In elucidating the relationship between teachers' satisfaction and burnout level, the Spearman correlation was employed. Moreover, regression analysis was used to determine the approximate change in teachers' satisfaction levels concerning their burnout level. Furthermore, to assemble the teachers' satisfaction and burnout levels into the same characteristics, the K-means clustering was employed to further understand the association of the said variables. All statistical results were tested at standard statistical significance levels (1% and 5%). Table 3 shows the possible ranges of the Spearman correlation coefficient and degree of relationship based on the study by Casinillo and Guarte (2018).

Table 3. Range of Spearman correlation coefficient

Spearman correlation coefficient (r_p)	Degree of relationship
$0.0 < r_p \leq 0.3$	Weak relationship
$0.3 < r_p \leq 0.7$	Moderate relationship
$0.7 < r_p \leq 1.0$	Strong relationship

Findings and Discussion

Based on Table 4, it is shown that teachers were still satisfied ($M=69.80$, $SD=9.79$) in their teaching career during modular distance learning despite the challenges they encountered. This implies that teachers are still motivated to work as part of their profession even if they are facing difficulties in the teaching-learning process amid the pandemic. According to Xun et al. (2021), teachers during the pandemic were enhancing their coping mechanisms and resilience to maintain their eagerness to teach and stay committed to their assigned tasks. On the other hand, it is revealed in Table 4 that teachers were highly burned ($M=34.79$, $SD=3.85$) in doing their jobs during the distance learning process amid the pandemic. The result indicates that teachers were physically and emotionally exhausted in facing the limitations and barriers of modular distance learning. Rubilar and Oros (2021) portrayed that teachers during the pandemic were stressed and burned out due to the paperwork assigned to them and how to deal with their students at a distance. The Spearman correlation analysis revealed that the relationship between teachers' satisfaction and burnout levels is inversely related ($r_p=-0.309$, $p\text{-value}<0.001$). Based on Table 3, the degree of relationship between the two variables is moderate. This implies that as the teachers are highly burnout in their assigned work, their level of satisfaction or well-being is decreasing moderately. In the study of Chávez et al. (2022), it is depicted that teachers were facing several technical problems in delivering their lessons to their students at a distance which caused them stress and burnout and negatively affected their teaching performance and satisfaction level.

Table 4. Descriptive statistics and Spearman correlation for teachers' satisfaction and burnout level

Variables	M	SD	Min	Max	Interpretation	r_p	$p\text{-value}$
Satisfaction	69.80	9.79	50	93	Satisfied ^a	-0.309*	<0.001
Burnout	34.79	3.85	24	46	Highly burnout ^b		

Note: a - See Table 1; b - Highly burnout; * - Highly significant at 1% level of significance.

Table 5 depicted that in every 1 unit increase in burnout perception score, there is a corresponding decrease of 0.653 units in the satisfaction perception score of high school teachers. This result is significant at a 1% level which indicates that the satisfaction level of the teachers is significantly ($p\text{-value}=0.003$) and adversely affected by their burnout level. Based on Figure 1, it is shown that the regression line is downward sloping. This implies that the relationship between satisfaction and burnout level is inversely proportional which implies that teachers' motivation and well-being were negatively influenced by the stress and exhausting tasks during the modular distance learning amid the pandemic. Cheptea et al. (2021) stated that the unprecedented situation and unfamiliar methods of teaching hurt the well-being of teachers which increases the burnout level and decreases the satisfaction. In the study of Ozamiz-Etxebarria et al. (2021), it is mentioned that due to the new ways of teaching at a distance during the pandemic, teachers were accumulating negative mental symptoms that caused them to anxiety and depression which affected their teaching performance. It is worth noting that teaching is considered a high-stress profession and during the pandemic, burnout levels is more increasing because of the challenges and barriers in the teaching-learning process in distance education, hence, teachers'

burnout has adversely affected the school effectiveness and climate for students (Chen et al., 2020; Sokal et al., 2021).

Table 5. Linear regression model for teachers' satisfaction and burnout level

	Coefficient	Std Error	p-value
Burnout level	-0.653*	0.216	0.003
Constant	92.523*	7.556	<0.001
n		132	
F-computed		9.16*	
p-value		0.003	
R-squared		0.066	

Note: * - Highly significant at 1% level of significance. The dependent variable is the teachers' satisfaction level

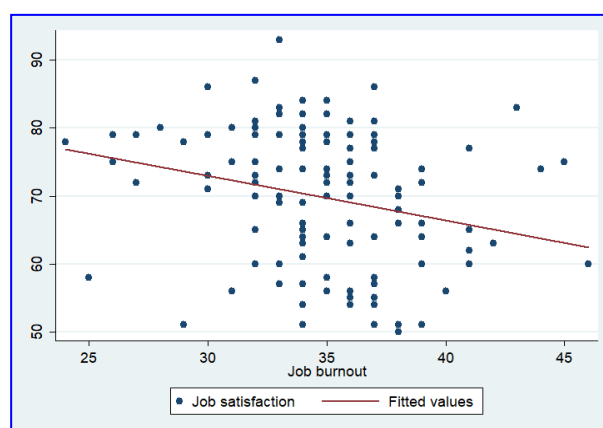


Figure 1. Scatter plot and regression line

It is shown in Table 6 that all clusters have the same teachers' job satisfaction and burnout levels. This implies that teachers during the time of distance learning were consistently burnout but satisfied with their assigned work. It is shown that in cluster I, the job satisfaction score is close to 70.80 (SD=10.62) and the burnout score is close to 35.38 (SD=12.42) which can be interpreted as "satisfied" and "highly burnout", respectively. In cluster II, the teachers' satisfaction score is approximately equal to 80.02 (SD=11.57), and the teachers' burnout score is approximately equal to 32.96 (SD=13.41) which indicates that teachers were "satisfied" and "highly burnout", respectively. Moreover, in cluster III, on average, the teachers' satisfaction score is close to 69.79 (SD=95.90) and the teachers' burnout score is close to 34.79 (SD=14.79) which indicates that teachers were "satisfied" and "highly burnout", respectively. This implies that teachers were still doing their job and responsibilities as educators while facing unprecedented challenges during distance learning as a modular type. According to Xun et al. (2021), teachers during the pandemic were developing resilience to somehow cope with the difficulties in delivering lessons to their students which contributed to a gratifying feeling for them despite the rising burnout level.

Table 6. K-Means clustering for teachers' job satisfaction and burnout level

Cluster	Descriptive metrics	Job satisfaction	Job burnout
I (n=45; 34.09%)	Mean	70.80	35.38
	Standard deviation	10.62	12.42
	min	65	27

Cluster	Descriptive metrics	Job satisfaction	Job burnout
II (n=45; 34.09%)	max	77	45
	Interpretation	<i>Satisfied^a</i>	<i>Highly burnout^b</i>
	Mean	80.02	32.96
	Standard deviation	11.57	13.41
	min	75	24
	max	93	43
III (n=42; 31.82%)	Interpretation	<i>Satisfied^a</i>	<i>Highly burnout^b</i>
	Mean	69.79	34.79
	Standard deviation	95.90	14.79
	min	50	24
	max	93	46
	Interpretation	<i>Satisfied^a</i>	<i>Highly burnout^b</i>

Note: a - see Table 1; b - see Table 2.

In Figure 2, it is presented that the three clusters have a little distance to each other, in other words, the scatter plot is compact. Cluster II possesses the highest job satisfaction score followed by Cluster I and the lowest job satisfaction score falls at Cluster III. This means that teachers at cluster II were the highest satisfied with their jobs and willing to do their work despite the exhausting nature of modular distance learning.

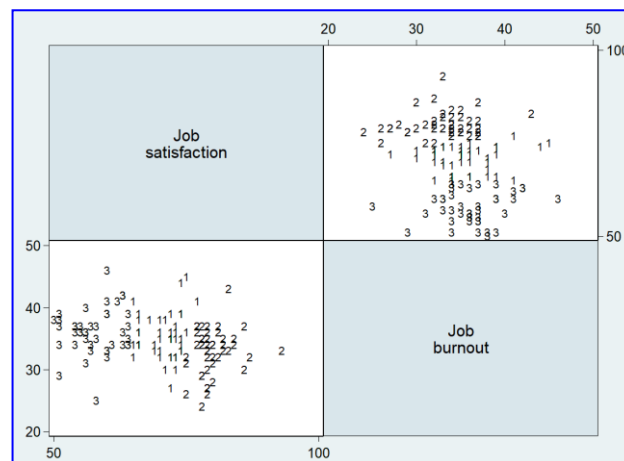


Figure 2. K-means clustering (K=3).

Samifanni and Gumanit (2021) portrayed that teachers were showing endurance and patience in dealing with limitations and struggles in the teaching process to create positivity in the learning process for their students. Also, teachers were applying some innovative teaching strategies to lessen their work in delivering their lessons (Jr. & Casinillo, 2020; Yu et al., 2021). In that case, the challenges do not hinder the passion of teachers to impart knowledge to their students and they were still motivated and satisfied with their work by thinking of the situation as temporary and not for a lifetime. In the study of De Aquino et al. (2023), it was revealed that teachers were willing to sacrifice just to accomplish their assigned tasks as teachers and apply coping mechanisms to survive the unprecedented challenges during the pandemic. Moreover, despite the difficulties during the pandemic, teachers were willing to provide caring service to their

students and they always made plans and improved their teaching method to promote quality learning amid distance education (Gonçalves, 2020).

Conclusion

The main goal of this research article is to measure the teachers' satisfaction and burnout levels during distance education and elucidate the association between the two variables of interest. Based on descriptive results, it is shown that the teachers were "satisfied" and "highly burnout" during the modular distance learning amid the pandemic. This implies that teachers are willing to do their job with confidence despite the exhausting and challenging situation in distance education. It is revealed by the Spearman correlation that teachers' satisfaction and burnout have a highly significant inverse relationship. Conclusively, the burnout level that teachers were experiencing adversely affects their satisfaction and well-being. Burnout diminishes the personal identity of the teachers and reduces their accomplishments due to work-related depression and stress. In addition, the regression analysis portrayed that in every 1 unit increase in the burnout perception score, there is a corresponding decrease of 0.653 units in the satisfaction perception score which is highly significant. Moreover, the K-means clustering depicted that teachers' satisfaction and burnout levels are compact which can be interpreted as high burnout but satisfaction in teaching. In that case, teachers were performing in the workplace but could feel exhaustion and stress. Henceforth, it is highly suggested that school leaders must reduce the teachers' tasks during modular distance learning to increase the well-being of teachers. Additionally, teachers must be provided with incentives and opportunities to take a vacation to relieve stress. It is recommended that a similar study be realized in other parts of the Philippines to gather richer information about the satisfaction and burnout levels of teachers during modular distance learning.

References

- Ali, B.J., & Anwar, G.(2021). An empirical study of employees' motivation and its influence job satisfaction. *International Journal of Engineering, Business and Management*, 5(2), 21-30. <https://doi.org/10.22161/ijebm.5.2.3>
- Casinillo, E. L., Lina Jr, E. R., Casinillo, L. F., Batidor, P. G., & Lebante, M. R. (2022). Econometric evidence on statistical anxiety of engineering students during the new normal setup. *Philippine Social Science Journal*, 5(4), 9-17. <https://doi.org/10.52006/main.v5i4.564>
- Casinillo, L. F. (2023). Are students submitting their mathematics outputs on time during the COVID-19 pandemic? A statistical modeling. *Canadian Journal of Family and Youth/Le Journal Canadien de Famille et de la Jeunesse*, 15(3), 100-112. <https://doi.org/10.29173/cjfy29908>
- Casinillo, L., & Guarte, J. (2018). Evaluating the effectiveness of teaching strategies: The case of a national vocational school in Hilongos, Leyte. *Review of Socio-Economic Research and Development Studies*, 2(1), 65-80.

- Castroverde, F., & Acala, M. (2021). Modular distance learning modality: Challenges of teachers in teaching amid the Covid-19 pandemic. *International Journal of Research Studies in Education*, 10(8), 7-15. <https://doi.org/10.5861/ijrse.2021.602>
- Chávez, J. P. M., Contreras, R. G., & Valle-Cruz, D. (2022). Burnout and online education: Adaptation and validation of scale during pandemic. *Telos: Revista de Estudios Interdisciplinarios en Ciencias Sociales*, 24(1), 24-39.
- Chen, H., Liu, F., Pang, L., Liu, F., Fang, T., Wen, Y., Chen, S., Xie, Z., Zhang, X., Zhao, Y., & Gu, X. (2020). Are you tired of working amid the pandemic? The role of professional identity and job satisfaction against job burnout. *International journal of environmental research and public health*, 17(24), 9188. <https://doi.org/10.3390/ijerph17249188>
- Cheptea, D., Russu-Deleu, R., Meşina, V., Friptuleac, G., & Cebanu, S. (2021). Assessment of burnout among teachers during the COVID-19 pandemic. *Archives of the Balkan Medical Union*, 56(2), 179-184. <https://doi.org/10.31688/ABMU.2021.56.2.06>
- Dayagbil, F. T., Palompon, D. R., Garcia, L. L., & Olvido, M. M. J. (2021). Teaching and learning continuity amid and beyond the pandemic. *Frontiers in Education*, 6, 678692. <https://doi.org/10.3389/feduc.2021.678692>
- De Aquino, M. A., Balingit, A. M., Bontog, A. D., Fortugaliza, P. J. S., Hungo, M. O., & Casinillo, L. F. (2023). The sentiments of students and teachers on modular distance learning amid the health crisis. *Indonesian Journal of Educational Research and Review*, 6(2), 299-309. <https://doi.org/10.23887/ijerr.v6i2.61478>
- Demerouti, E., & Bakker, A. B. (2008). The Oldenburg burnout inventory: A good alternative to measure burnout and engagement. *Handbook of stress and burnout in health care*, 65(7), 1-25.
- Dicke, T., Marsh, H. W., Parker, P. D., Guo, J., Riley, P., & Waldeyer, J. (2020). Job satisfaction of teachers and their principals in relation to climate and student achievement. *Journal of educational psychology*, 112(5), 1061-1073. <https://doi.org/10.1037/edu0000409>
- Gonçalves, S. P. (2020). Education in the context of the pandemic: A look at the case of Portugal. *Revista Românească pentru Educație Multidimensională*, 12(1 Sup2), 78-85.
- Harmsen, R., Helms-Lorenz, M., Maulana, R., & Van Veen, K. (2018). The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition. *Teachers and Teaching*, 24(6), 626-643. <https://doi.org/10.1080/13540602.2018.1465404>
- Hashim, R., Bakar, A., Noh, I., & Mahyudin, H. A. (2020). Employees' job satisfaction and performance through working from home during the pandemic lockdown. *Environment-Behaviour Proceedings Journal*, 5(15), 461-467. <https://doi.org/10.21834/ebpj.v5i15.2515>
- Jr, A. N.Y., & Casinillo, L. F. (2020). Effect of physics education technology (PhET) simulations: Evidence from stem students' performance. *Journal of Education Research and Evaluation*, 4(3), 221-226. <https://doi.org/10.23887/jere.v4i3.27450>

- Lester, P. E. (1987). Development and factor analysis of the teacher job satisfaction questionnaire (TJSQ). *Educational and psychological Measurement*, 47(1), 223-233. <https://doi.org/10.1177/0013164487471031>
- Ozamiz-Etxebarria, N., Mondragon, N.I., Bueno-Notivol, J., Pérez-Moreno, M., & Santabárbara, J. (2021). Prevalence of anxiety, depression, and stress among teachers during the COVID-19 pandemic: A rapid systematic review with meta-analysis. *Brain sciences*, 11(9), 1172. <https://doi.org/10.3390/brainsci11091172>
- Reis, D., Xanthopoulou, D., & Tsaousis, I. (2015). Measuring job and academic burnout with the Oldenburg burnout inventory (OLBI): Factorial invariance across samples and countries. *Burnout research*, 2(1), 8-18. <https://doi.org/10.1016/j.burn.2014.11.001>
- Rubilar, N.V., & Oros, L. B. (2021). Stress and burnout in teachers during times of pandemic. *Frontiers in psychology*, 12, 756007. <https://doi.org/10.3389/fpsyg.2021.756007>
- Samifanni, F., & Gumanit, R. L. R. (2021). Survival with technology: Elderly teachers' perspective towards emergency online learning during the COVID-19 pandemic in the Philippines. *Studies in Learning and Teaching*, 2(3), 98-114. <https://doi.org/10.46627/silet.v2i3.87>
- Sokal, L., Trudel, L. E., & Babb, J. (2020). Canadian teachers' attitudes toward change, efficacy, and burnout during the COVID-19 pandemic. *International Journal of Educational Research Open*, 1, 100016. <https://doi.org/10.1016/j.ijedro.2020.100016>
- Sokal, L., Trudel, L. E., & Babb, J. (2021). I've had it! Factors associated with burnout and low organizational commitment in Canadian teachers during the second wave of the COVID-19 pandemic. *International Journal of Educational Research Open*, 2, 100023. <https://doi.org/10.1016/j.ijedro.2020.100023>
- Xun, Y., Zhu, G., & Rice, M. (2021). How do beginning teachers achieve their professional agency and resilience during the COVID-19 pandemic? A social-ecological approach. *Journal of Education for Teaching*, 47(5), 745-748. <https://doi.org/10.1080/02607476.2021.1945415>
- Yu, H., Liu, P., Huang, X., & Cao, Y. (2021). Teacher online informal learning as a means to innovative teaching during home quarantine in the COVID-19 pandemic. *Frontiers in Psychology*, 12, 596582. <https://doi.org/10.3389/fpsyg.2021.596582>