

Percieved Impact of Covid-19 Pandemic on Social Competence and Depression among Tertiary Institution Students in Benue and Nasaraws States, Nigeria.

Anna Ngweye Owunebe, Professor Peter Terfa Ortese & Dr Joseph Audu Obida

Department of Educational Foundations, Benue State University, Makurdi, Benue State.

DOI: https://dx.doi.org/10.47772/IJRISS.2024.803191

Received: 27 February 2024; Revised: 07 March 2024; Accepted: 16 March 2024; Published: 23 April 2024

ABSTRACT

This study investigated the perceived impact of COVID-19 pandemic on social competence and depression adjustment of tertiary institution students in Benue and Nasarawa States, Nigeria. The study was guided by two research questions and two hypotheses. The study adopted a descriptive survey research design. The population of the study comprised 75,289 students in 11 tertiary institutions Benue and Nasarawa States out of which 399 students where sampled using multi-stage sampling procedure. This involved conducting the sampling procedure in stages, with different techniques being adopted at different stages. The instrument used for data collection was a structured questionnaire titled "Covid-19, Academic, Psychosocial Adjustment Questionnaire (CAPAQ)" developed by the researcher. The data collected were analyzed using Mean scores and Standard Deviation to answer the research questions while the hypotheses were tested using chi-square statistics at 0.05 level of significance. The result revealed that COVID-19 pandemic had a significant impact on students' social competence and depression in Benue and Nasarawa States. Based on the findings of this study, it was recommended that Students should be helped by the teachers and counsellors to become socially competent by acquainting them with social skills like virtual communication, online networking, and digital collaboration skills to go through social problems affecting their social competence due to pandemics like COVID-19. Students should be sensitized through workshops on how to improve their social interaction (e-conferences, online communications) whenever a pandemic strikes, as this could go a long way in reducing the level of isolation felt during social distancing. Counsellors should help students to adopt stress coping strategies so as to avoid depression whenever there is a lockdown or social distancing during pandemics.

Keywords: COVID-19 pandemic, Social competence and Depression

INTRODUCTION

The impact of COVID-19 has been devastating worldwide, and the education sector has been particularly hard hit, as stated by the Global Campaign for Education (GCE, 2021). Since its outbreak in late December, 2019, COVID-19 has wreaked havoc globally by affecting workers and students in schools, colleges and universities. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO 2020), over 800 million learners worldwide have been affected by the pandemic. Shockingly, one in every five learners cannot attend school, while one in four is unable to attend higher education classes. Furthermore, more than 102 countries have mandated nationwide school closure, with an additional 11 implementing localized closures (Global Campaign for Education, 2021). The outbreak of COVID-19 in March, 2020 had a profound impact on the Europe, Africa and Asia Union leading governments to





implement urgent and invasive measures to prevent the spread of the disease. During the peak of the pandemic, 45 countries in Europe and Central Asia Region made the difficult decision to close their schools thereby affecting a staggering 185 million students.

According to the UK Aid Report (2020), governments across Africa, including Nigeria, also implemented early closures of educational institutions. The sudden closure left little time to plan for alternative educational approaches, leading to significant challenges. This issue had a severe impact on many African countries, where educational disparities between the elite and less advantaged, mainly in rural areas, are prevalent. While some governments swiftly launched educational programs on television and radio, these resources were only accessible to those with access to television or radio sets. Similarly, online learning was limited to individuals with internet connectivity (UK Aid Report, 2020).

The first case of the Corona Virus Disease was reported in Nigeria on February 27, 2020 in Lagos State, when an Italian citizen tested positive for the virus (Nigeria Centre for Disease Control, 2020). Since then, the number of infections reported by the Nigeria Centre for Disease Control (NCDC) has continued to rise across the country. The pandemic has spread to all 36 states of the federation, including the Federal Capital Territory, Benue, and Nasarawa States. In response to these disruptions, the federal and state governments in Nigeria took measures such as online teaching to digitize the education system. Although online education is not new in Nigeria, it has had a significant impact on the education landscape, as modern devices with wireless internet access enable people to receive and submit completed tasks with just one click, regardless of their location, whether rural or urban. Students in higher learning were expected to meet academic demands, form new friendships, become more independent, take responsibility in their personal lives and make career choices. While many students were able to cope with these challenges and successfully adjust to tertiary institution life, others felt overwhelmed and encounterd various adjustment problems.

Social competence refers to a set of social skills and abilities that are necessary for individuals to interact effectively and positively with others in various social settings (Bornstein, Hahn & Haynes, 2010). It encompasses a range of skills such as empathy, emotional regulation, perspective-taking, cooperation, friendliness and problem-solving abilities in social situations. These social competencies play a crucial role in a person's social environment, helping to protect against chronic or traumatic conditions and supporting recovery from mental illness. However, with the advent of the COVID-19 pandemic, the ability to engage with others, exhibit constructive behaviour in group settings, and practice, these social competencies were disrupted. The pandemic and the subsequent social distancing measures impacted the social competence of tertiary institution students. The limitations to face-to-face interactions, social gatherings and increased reliance on remote communication affected students' opportunities to practice and develop their social skills.

Depression is a mood disorder characterized by severe or prolonged feeling of sadness, loss of interest, social opposing and worthless negative thoughts. Depression as a mood disorder, it accompanied by a set symptoms such as persistent feeling of sadness, feelings of guilt and low self-esteem, thought disorder, social isolation, anxiety and so on. Depression is caused by traumatic events. COVID-19 was one of such traumatic events in the life of students. COVID-19 pandemic seemed to have negative mental and social consequences. It caused social isolation, loneliness, anxiety and among others. Recent data shows that significantly higher share of people who were sheltering in place (47%) reported negative mental health effects resulting from worry or stress related to coronavirus than among those not sheltering in place (37%). Negative mental health effects due to social isolation were particularly pronounced among older adults and households with adolescents, as these groups were at risk for depression or suicidal ideation (Panchal, Kamal & Orgera, 2020). It is against this background that, the study seeks to examine the perceived impact of COVID-19 pandemic on social competence and depression among Tertiary Institution students in Benue and Nasarawa States.





OBJECTIVE OF THE STUDY

Specifically, the study sought to:

- 1. Ascertain the perceived impact of COVID-19 pandemic on students' social competence during the lockdown in Benue and Nasarawa States.
- 2. Determine the perceived impact of COVID-19 pandemic on students' depression during the lockdown in Benue and Nasarawa States

Research Questions

The following two research questions guided the study:

- 1. What is the perceived impact of COVID-19 pandemic on students' social competence during the lockdown in Benue and Nasarawa States?
- 2. What is the perceived impact of COVID-19 pandemic on students' depression during the lockdown in Benue and Nasarawa States?

Hypotheses

The following two hypotheses were formulated and tested at 0.05 level of significance

- 1. COVID-19 pandemic has no significant impact on students' social competence during the lockdown in Benue and Nasarawa States.
- 2. COVID-19 pandemic has no significant impact on students' depression during the lockdown in Benue and Nasarawa States.

RESEARCH METHOD

The design of this study was a descriptive survey. This design is the approach that describes systematically collecting data about a group of individuals. The population of this study comprised 75,289 students in 11 tertiary institutions in Benue and Nasarawa States (Ministry of Education, Benue and Nasarawa State, 2022). Seven tertiary institutions from Benue and Four tertiary institutions from Nasarawa States. The sample size for this study consists 399 students from Benue and Nasarawa States. This was based on minimum sample size requirement as proposed by Emaikwu (2013) who states that for a study of a known population N and error level, the minimum size requirement should be given by the formula n =

A multistage sampling procedure was employed for this study. This was due to the need for different sampling techniques at each stage. This involved conducting the sampling procedure in stages, with different techniques being adopted at different stages. The instrument used for data collection in this study was a self-structured validated questionnaire titled "Covid-19, Academic and Psychosocial Adjustment Questionnaire (CAPAQ)" developed by the researcher. It consisted of 48 items designed to gather information related to specific study variable and each item in the questionnaire was presented with response options ranging from Strongly Agree (4), Agreed (3) Disagree (2) to Strongly Disagree (1) Mean score and Standard Deviation (SD) was used to answer the research questions. While chi-square was used to test the hypotheses at 0.05 level of significance. The decision level was determined by the use of criterion mean of 2.50 for clusters 1 and 2 Mean of 2.50 and above was accepted, while mean that is below 2.50 was rejected. The hypotheses were tested using chi-square statistic at 0.05 level of significance to establish the impact of COVID-19 Pandemic on social competence and depression among tertiary institution students in Benue and Nasarawa States, Nigeria. The obtained scores from the trial test were used to calculate the



reliability coefficient of the instrument, which was found to be 0.97. Additionally, when analyzed by clusters, the instrument yielded reliability coefficients of 0.84, 0.90, 0.82, 0.91, 0.84, and 0.87 for the six respective clusters. These coefficients were considered high enough to establish the instrument's reliability for the study. This determination aligns with the recommendation of Cronbach, who suggests that a questionnaire can be considered reliable if the coefficient is above 0.50, which is the minimum recommended coefficient of variation (CVI) for survey studies

Research Question 1: What is the perceived impact of COVID-19 pandemic on students' social competence during the lockdown in Benue and Nasarawa States?

Table 1: Mean and Standard Deviation on the perceived impact of COVID-19 pandemic on Social Competence during during lockdown.

S/N	Item Description	SA	A	D	SD	N	X	SD	Decision
1	Covid-19 pandemic affected students' competence in creating and maintaining social relationships.	140	142	57	60	399	2.91	1.04	Agree
2	Social distancing during covid-19 pandemic complicated the social competence of students	134	152	53	60	399	2.9	1.03	Agree
3	Students' were no longer efficient in their social skills due to social distancing because of Covid-19 pandemic.	149	138	45	67	399	2.92	1.08	Agree
4	Students' effectiveness in resolving social issues was affected due to Covid-19 lock down.	134	151	48	66	399	2.88	1.05	Agree
5	Students' capability to liaise with one another was hampered because of Covid-19 lockdown.	147	144	43	65	399	2.93	1.06	Agree
6	Covid-19 pandemic affects students' ability to stabilize their relationship.	147	161	42	49	399	3.02	0.98	Agree
7	Students' aptitude to relate well with others was affected due to Covid-19 pandemic.	146	149	43	61	399	2.95	1.04	Agree
8	Students' know-how was affected due to isolation during Covid-19 pandemic.	164	155	37	43	399	3.1	0.96	Agree
	Cluster Mean and Standard Deviation						2.95	1.03	Agree

Table 1 shows the mean and standard deviation of items 17-24 as 2.91, 2.90, 2.92, 2.88, 2.93, 3.02, 2.95 and 3.10 with a corresponding standard deviation of 1.04, 1.03, 1.08, 1.05, 1.06 and .98 respectively. The cluster mean was 2.95 and a standard deviation was 1.03 which is above the cut-off mean point of 2.50. The result entails that respondents have accepted that Covid-19 pandemic affected students' competence in creating and maintaining social relationships. Social distancing during Covid-19 pandemic complicated the social competence of students; students were no longer efficient in their social skills due to social distancing because of Covid-19 pandemic. Students' effectiveness in resolving social issues was affected due to Covid-19 lock down, students' capability to liaise with one another was hampered because of covid-19 lockdown, Covid-19 pandemic affects students' ability to stabilize their relationship, Students' aptitude to relate well with others was affected due to covid-19 pandemic, and Students' know-how was affected due to isolation during Covid-19 pandemic. This result implies that COVID-19 pandemic had perceived impact on students' social competence in Benue and Nasarawa States.



Research Question 2: What is the perceived impact of COVID-19 pandemic on students' depression in Benue and Nasarawa States?

Table 2: Mean and Standard Deviation on the Perceived Impact of COVID-19 on Depression

S/N	Item Description	SA	A	D	SD	N	X	SD	Decision
9	Restricting students during covid-19 pandemic makes them to become moody.	146	153	68	32	399	3.04	0.93	Agree
10	Social distance made students to become miserable and unhappy while staying at home.	141	157	66	35	399	3.01	0.93	Agree
11	Restricting students from social activities led to dejection and thus make them sad.	123	157	68	51	399	2.88	0.99	Agree
12	Students became downhearted as a result of isolation during covid-19 syndrome	119	157	68	55	399	2.85	1	Agree
13	Students become hopeless as their future seem to be delay by covid-19 lockdown	112	151	72	64	399	2.78	1.03	Agree
14	Students become declined to themselves as they were no longer active due to covid-19 pandemic	108	148	77	66	399	2.75	1.03	Agree
15	Students feel rejected as they found themselves restricted to particular environment due to covid-19 pandemic	105	150	77	67	399	2.73	1.03	Agree
16	Students feel inferior as no longer study continuously with their foreign counterparts	88	158	81	72	399	2.66	1.03	Agree
	Cluster Mean and Standard Deviation					399	2.8	1	Agree

Table 2 shows the mean and standard deviation of items 41-48 as follows 3.04, 3.01, 2.88, 2.85, 2.78, 2.75, 2.73 and 2.66 with a corresponding standard deviation of .93, .93, .99, 1.00, 1.03, 1.03, 1.03 and 1.03 respectively with a cluster mean of 2.80 and a standard deviation of 1.00 above the cut-off mean point of 2.50. The result implies that respondents have accepted that restricting students during covid-19 pandemic makes them to become moody, social distance made students to become miserable and unhappy while staying at home, restricting students from social activities led to dejection and thus make them sad, students became downhearted as a result of isolation during covid-19 syndrome, students become hopeless as their future seem to be delay by covid-19 lockdown, students become declined to themselves as they were no longer active due to covid-19 pandemic, students feel rejected as they found themselves restricted to particular environment due to covid-19 pandemic and students feel inferior as no longer study continuously with their foreign counterparts. This result implies that COVID-19 pandemic have perceived impact on students' depression in Benue and Nasarawa States.

RESULTS

Testing the hypotheses:

Hypothesis 1: COVID-19 pandemic has no significant impact on students' depression in Benue and Nasarawa States.

Table 1: Chi-Square Analysis on the Impact of COVID-19 Pandemic on Students' Social Competence

Responses	Fo	Fe	Df	x^2	p	Remark
Strongly Disagree	59	99.8				

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume VIII Issue III March 2024



Disagree	46	99.8				
Agree	149	99.8	3	90.454	0	Significant
Strongly Agree	145	99.8				
Total	399					

Table 9 shows that $x^2(df, 3) = 90.454$, p = 0.00 < 0.05. Since the p value is less than the alpha value of 0.05 the null hypothesis is rejected. This implies that COVID-19 pandemic had a significant impact on students' social competence in Benue and Nasarawa States.

Table 2: Chi-Square Analysis on the Impact of COVID-19 Pandemic on Students' Depression

Responses	Fo	Fe	df	x^2	p	Remark
Strongly Disagree	54	99.8				
Disagree	72	99.8				
Agree	154	99.8	3	61.922	0	Significant
Strongly Agree	119	99.8				
Total	399					

Table 12 shows that $x^2(df, 3) = 61.922$, p = 0.00 < 0.05. Since the p value is less than the alpha value of 0.05 the null hypothesis is rejected. This implies that COVID-19 pandemic has significant impact on students 'depression in Benue and Nasarawa States.

DISCUSSIONS OF FINDING

The first finding revealed that COVID-19 pandemic had significant impact on students' social competence in Benue and Nasarawa States. This finding tallies with Prastuti, Hitipeuw and Bahrodin (2020) who reported that lockdowns due to Covid-19 pandemic had negative impact on student's social competence. The finding also agrees with the findings of Casey, G., Shayegh, S., Moreno-Cruz, J., Bunzl, M., Galor, O., & Caldeira, K. (2019), Hurrell, K., Houwing, J., & Hudson, J. L. (2020) Janssen et al., 2020; Orgilés, M., Morales, A., Delvecchio, E., Mazzeschi, C., & Espada, J. P. (2020). and Smirni, P., Lavanco, G., & Smirni, D. (2020) who reported that Covid-19 pandemic had adverse impact on social competence of students. It created decreased awareness and acceptance of emotions, difficulties in regulating social life. This finding is significant because social isolation is the major hindrance to the development of social competence or interaction skills due to Covid-19 pandemic, the Federal Government introduced curtailing measures such as working from home for all categories of workers. Other measures were close down of schools, social events and social centres. The inability for students to meet with their lecturers and other students inhibited their social interaction and by implication their social competence. As a result, many students found life at home very boring, isolative and punitive. This affected their cognitive and emotional behaviours. Thus, most of them resorted to internet addiction and anti-social behaviours. Many students loss interest in their studies at home as a result of the pandemic. This is why most parents complained of difficulties keeping their children at home during the period of Covid-19 pandemic.

1. The second finding revealed that COVID-19 pandemic had significant impact on students 'depression in Benue and Nasarawa States. This finding is in line with Lopes and Nihei (2021) who found that most of the undergraduates presented symptoms of depression, anxiety and stress. The researcher observed that prolonged anxiety and stress lead to depression. Similarly, Azizah (2021) observed high levels of depression, anxiety, stress and low levels of resilience among undergraduates during the





pandemic. In addition, Walid A., Alaa H., Haneen A. A. & Jarab, J. L. (2021) findings revealed that several factors were associated with depression and anxiety during pandemic, most especially students who were to live alone and away from their primary country of residence. The proportion of depression and anxiety was higher after March declaration of lockdown measures. The result was significant because, traumatic events cause fear, anxiety, depression and other mental ill health Against the background that Covid-19 pandemic was a traumatic event in the life of students and citizens in general. It is quite obvious that students in the area under study could not be an exception. The prolonged lockdown, social isolation and dreadful information emanating from social media were strong enough to cause depression to students. This was more among students with predisposing conditions of mental ill-health such as anxiety, frustration and loss of academic years. Other predisposing factors were loss of business, postpone Relationship between Covid-19 and Post-traumatic stress disorder in Nigerian tertiary institutions

ement of marriage ceremonies, financial hardships and feeding challenges. It is not surprising that students in the study area were seen exhibiting symptoms of withdrawal, loss of social interest in reading and other social activities they usually enjoyed.

CONCLUSION

The findings of this study have shown that COVID-19 pandemic had impact on social competence and depression of tertiary institution students in Benue and Nasarawa States. This impact is observed in the areas of students' depression and social competence due to the traumatic experiences to both students and institutions of higher learning in the area under study during Covid-19 pandemic era. This has therefore called for preventive measures to cope or adjust in case of its re-occurrence.

RECOMMENDATIONS

- 1. Students should be helped by teachers and counsellors to become socially competent by acquainting them with social skills like online interactions such as e-conference, social networking, distance online learning, skill acquisitions like making of hair shampoo, detergents that keeps them engaged during COVID-19 pandemic.
- 2. Counsellors should help students to adopt stress coping strategies inoculation, this strategy help clients to fight fear and so avoid depression whenever there is a lockdown or social distancing during pandemics.

SUGGESTIONS FOR FURTHER STUDIES:

- 1. Correlates of the COVID-19 pandemic and mental health of students' in Tertiary Institutions in Benue and Calabar Statas.
- 2. Relationship between Covid-19 and Post-traumatic stress disorder in Nigerian tertiary institutions

REFERENCES

- 1. Anderson, M. (2013). The experience of depression in first –year university students living in residence: A phenomenological inquiry. *Dissertation Abstracts International*, 42-03 (736).
- 2. Augustina, I. (2017). Comparative analysis of gender differences and adjustment capacities among secondary school students in Kaduna State. *Education for Today*, 13(1), 50-54.
- 3. Azizah A.(2021) studied the impact of the COVID-19 Pandemic on Students' Mental Health and Sleep in Saudi Arabia. *International Journal of Environment Research in Public Health*, 18(17), 9344
- 4. Ben-Ezra, M., Sun, S., Hou, W. K., & Goodwin, R. (2020). The association of being in quarantine and

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume VIII Issue III March 2024



- related COVID-19 recommended and non-recommended behaviours with psychological distress in Chinese population. *Journal of Affective Disorder*.275, 66–68.
- 5. Bornstein, M. H., Hahn, C. S., & Haynes, O. M. (2010). The influence of the COVID-19 pandemic on academic and psychosocial adjustment of tertiary institution students. *Journal of Applied Social Psychology*, 40(5), 1125-1149.
- 6. Casey, G., Shayegh, S., Moreno-Cruz, J., Bunzl, M., Galor, O., & Caldeira, K. (2019). The impact of climate change on fertility. *Environmental Research Letters*, 14(5), 054007.
- 7. Cruz, R. A., Peterson, A. P., Fagan, C., Black, W., & Cooper, L. (2020). Evaluation of the Brief Adjustment Scale 6 (BASE-6): A measure of general psychological adjustment for measurement-based care. *Psychological Services*, 17(3), 332–342.
- 8. Esposito, S., Principi, N. (2020). School closure during the Coronavirus disease 2019. (COVID-19) pandemic: an effective intervention at the global level. Europe retrieved from http://academia.com/hhfhhfhh/ddgggg on Retrieved on 21 August, 2021.
- 9. Global Campaign for Education (GCE) (2021). Corona Virus: Don't Let Our Children Down. Retrieved from https://campaignforeducation.org/en/press-centre/coronavirus-dont-let-our-children-down?gclid. 15 may, 2020.
- 10. Hurrell, K., Houwing, J., & Hudson, J. L. (2017). Exploring the role of emotion regulation in the development of internalizing and externalizing problems in childhood. *Frontiers in Psychology*, 8, 1642.
- 11. Iyam, M.A. & Atah, V. A. (2021). Effect of adjustment behaviour on fresh undergraduates in vocational education, University of Calabar, Nigeria. *European Journal of Scientific Research*, 159(1), 6 14.
- 12. Lopes, A. R. & Nihei, O. K. (2021) Depression, anxiety and stress symptoms in Brazilian university students during the COVID-19 pandemic: Predictors and association with life satisfaction, psychological well-being and coping strategies. 16(10), e0258493.
- 13. Liu, S., Yang, L., Zhang, C., Xiang, Y.-T., Liu, Z., Hu, S., & Zhang, B. (2020). Psychosocial adjustment of tertiary institution students during the COVID-19 pandemic: A cross-cultural study. *Journal of Cross-Cultural Psychology*, 51(4), 532-548.
- 14. National Health Commission of China. (2020). *The Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia* (interim sixth edition). Retrieved March 31, 2021 from http://www.gov.cn/zhengce/zhengceku/2020-02/19/content5480948.htm
- 15. Orgilés, M., Morales, A., Delvecchio, E., Mazzeschi, C., & Espada, J. P. (2020). Immediate psychological effects of the COVID-19 quarantine in youth from Italy and Spain. *Frontiers in psychology*, 2(9), 83-86.
- 16. Peterson, A. P. (2015). Psychometric Evaluation of the Brief Adjustment Scale-6 (BASE-6): A *New Measure of General Psychological Adjustment* (Master dissertation). Washington, USA: University of Washington.
- 17. Prastuti, E. N., Hitipeuw, Y. D., & Bahrodin, A. (2020). The influence of student social competence on online learning during the COVID-19 pandemic. *Journal of Educational Sciences*, 4(1), 15-25.
- 18. Smirni, P., Lavanco, G., & Smirni, D. (2020). Anxiety in Older Adolescents at the Time of COVID-19 *Journal of clinical medicine*, 9(10), 30-64.
- 19. Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A. & Iosifidis, C. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19), A Review International Journal of Surgery 78, 185–93.
- 20. Panchal, N., Kamal, R., & Orgera, K. (2020). The implications of COVID-19 for mental health and substance use. *Kaiser Family Foundation*, 1(3),1–16.
- 21. (2020). Education: From Disruption to Recovery. Retrieved March 31, 2021 from https://en.unesco.org/covid19/education response.
- 22. Walid A., Alaa H., Haneen A. A & Jarab J. L (2021). Anxiety and depression among pharmacy students before and during covid-19 pandemic in Al-Zaytoonah University of Jordan, *Tropical Journal of Pharmaceutical Resources* 20(5)1039-1047.



ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume VIII Issue III March 2024

- 23. Walton, W., Mazni, M., Murnizam, H. & Ferlis, B. (2017). Attachment as a predictor of university adjustment among freshmen: Evidence from a Malaysian Public University.
- 24. Wathelet, M., Duhem, S., Vaiva, G., Baubet, T., Habran, E., Veerapa, E., & D'Hondt, F. (2020). Factors associated with mental health disorders among university students in France confined during the COVID-19 pandemic. *Journal of American Medical Association*. 3(10), 225-591.