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The Association Between the Contraction of Infectious Diseases and Aggressive Behavior at School: A Study Among Adolescents in Ejigbo, Lagos, Nigeria

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Abstract

The study investigated whether there is an association between the contraction of infectious diseases and peer aggression in a school context. The study was carried out among 284 adolescents (152 girls, 132 boys; *M* age = 14.2 years, *SD* = 1.7) in Ejigbo, Lagos, Nigeria. It was measured how frequently the adolescents had contracted malaria, yellow fever, typhoid fever, and cough & flu. Both the perpetration of and victimization from peer aggression at school was measured with an adapted version of the Direct & Indirect Aggression Scales. The results showed a clear association between the contraction of all measured infectious diseases and peer aggression. It is suggested that it is not a question of cause and effect, but that a third factor, possible overcrowding, is a risk factor for both outcomes.

Keywords: Infectious diseases**,** malaria, typhoid fever, yellow fever, aggression, school

Introduction

The aim of the present study was to investigate the relationship between infectious diseases and aggression in peer groups at school among adolescents in Ejigbo, Lagos,

Nigeria. The study is part of a project investigating the relationship between overcrowding, aggression, and antisocial behavior in the same population (Makinde, Björkqvist, & Österman, 2016; 2017; 2019). Adolescents living in overcrowded conditions are exposed to different kinds of health issues. The new health guidelines of the World Health Organization (n.d.) highlight that crowded housing increases the risk of exposure to infectious and respiratory diseases, and it may also have an impact on mental health issues. The guidelines further state that improved housing conditions by installing basic housing needs will not only save lives, reduce emission, improve the quality of life and reduce poverty, but it will also contribute to achieving the UN's Sustainable Development Goals.

Health Issues and Overcrowding

Overcrowding and health issues have by several scholars been found to have an association with each other (Bansal & Saxena, 2002; Bartlett, 1999; Blake, Kellerson, Simic, Task, 2007; McNicholas, Lennon, Crampton, & Howden-Chapman, 2000). Overcrowding is also linked to poverty (Gove, Hughes, & Galle, 1979).

The health issues associated with overcrowding range from psychological stress (Edwards, Fuller, Vorakitphokatorn, & Sermsri, 1994) to infectious diseases such as tuberculosis and respiratory infections (Krieger & Higgins, 2002), delays in cognitive and psychomotor development (Evans, 2006), and increased incidents of colds, asthma, influenza and diarrhea, especially in young children (Causon-Kaas, Dzikus, Stephens, Højlyng, & Aaby, 1997; Kearns, Smith, & Abbott, 1992). Elender, Bentham, and Langford (1998) studied risk factors for tuberculosis in Wales, UK, and found that the risk was significantly higher in households where more than one person was living in each bedroom.

Guite, Clark, and Ackrill (2006) reported factors predicting poor mental health and vitality, and found that noise from the neighbors, overcrowding at home, and absence of satisfying green areas were such factors. Overcrowding is also thought to boost the vulnerability to malaria; as a result of high concentrations of carbon dioxide in the air and air pollution; the poor air quality is likely to facilitate the living conditions for mosquitos in overcrowded homes (Ghebreyesus, Haile, Witten, Getachew, Yohannes, Lindsay, & Byass, 2000).

Scholars from Nigeria and Uganda have found that malaria has a connection with long-term behavioral problems in children; in both studies, these problems ranged from lack of self-care to inattentiveness and hyperactivity, to the development of antisocial and abusive behavior, and even to hallucinations (Idro, Kakooza-Mwesige, Balyejjussa, Mirembe, Mugasha, Tugumisirize, & Byarugaba, 2010; Sowunmi, 1993).

Although infectious diseases have been linked to other health issues and to the development of behavioral problems, as shown above, no study has to this date investigated whether there is an association between infectious diseases and peer

aggression in a school context. The current study was designed to address this question.

Method

Sample

The respondents were 284 adolescents (152 girls, 132 boys; *M* age = 14.2 years, *SD* = 1.7) from five private secondary schools in Ejigbo, Lagos, Nigeria. The pupils were chosen randomly from both junior and senior schools to participate in the study.

Instrument

The respondents filled in a paper-and-pencil questionnaire during regular school lessons. The questionnaire included a number of scales and single items, of which here will be reported data on peer aggression (both perpetration and victimization), and how often the respondents had been sick with (1) malaria, (2) yellow fever, (3) typhoid fever, and (4) cough and flu. The response alternatives were 0 = never, 1 = seldom, 2 = sometimes, 3 = often, and 4 = very often.

Three types of aggression, physical, verbal, and indirect, were measured, based on the Direct & Indirect Aggression Scales (DIAS; Björkqvist, Lagerspetz, & Kaukiainen, 1992). The items were adapted to suit the situation in Nigerian schools. Single items and reliability scores of both the perpetration and the victim versions of the scales are presented in Table 1. The wordings in Table 1 pertain to the perpetration versions, but the victimization versions described the same acts (e.g. "I have been hit", "I have been locked in or out").

Table 1

Single Items and Cronbach's Alphas for Three Scales Measuring Physical, Verbal, and Indirect Aggression, Both for the Perpetrator and Victim Versions of the Scales. The Text Refers to the Perpetrator Versions. The First α-score Pertains to Perpetration, the Second to Victimization (N = 283)

Physical Aggression (α = .76, α = .74)	
	I hit somebody
	I locked somebody in or out
	I bit somebody
	I spit at somebody
	I threw objects at somebody

	I damaged somebody's items
Verbal Aggression (α = .78, α = .78)	
	I abused somebody
	I threatened to hurt somebody's items
	I yelled/shouted at somebody
	I picked a fight with somebody
	I intentionally said nasty things about somebody
	I called somebody bad names
Indirect Aggression (α = .68, α = .73)	
	I gossiped about somebody
	I spread false rumours about somebody
	I threatened to end the friendship with somebody
	I disclosed somebody's secrets
	I was rolling eyes at somebody
	I ignored somebody completely

Ethical Considerations

The data were collected with informed consent from pupils, parents, and school officials, and strict anonymity was observed. The study adhered to the principles concerning human research ethics of the Declaration of Helsinki (World Medical Association, 2013), as well as guidelines for the responsible conduct of research of The Finnish Advisory Board on Research Integrity (2012). The collected data are stored according to the regulations of the European Commission Data Protection (2016).

Results

The means and standard deviations for how often the respondents had contracted the diseases in question are presented in Table 2. Although the mean values are relatively low (the maximum value being 4), it should be noted that 15.1% of the respondents assessed that they had suffered from malaria "often" or "very often"; for yellow fever, the percentage was 3.6%, for typhoid fever it was 7.4%, and for cough and flu 12.7%.

The diseases all correlated significantly with each other; that is, if a respondent had contracted one disease, there was an increased likelihood that he or she had contracted others as well (cf. Table 2).

Table 2. Means and Standard Deviations of the Frequency Scores of Four Types of Diseases, and Correlations between the Diseases (N = 283)

Diseases	*M*	*SD*	1.	2.	3.
1. Malaria	1.58	1.10			
2. Yellow Fever	0.34	0.83	.18 **		
3. Typhoid Fever	0.64	1.05	.35 ***	.32 ***	
4. Cough and Flu	1.22	1.24	.41 ***	.22 ***	.31 ***

*** $p < .001$; ** $p < .01$

The associations between how often the respondents had suffered from either malaria, typhoid fever, yellow fever, and cough and flu, and how often they had been victims from or perpetrated either physical, verbal, or indirect aggression, are presented in Table 3. As the table reveals, the correlations were positive, either medium sized or low, but all were significant.

Table 3: Correlations between Four Types of Illnesses and Victimisation and Perpetration of Three Types of Aggression (N = 283)

	Victimisation from Aggression			Perpetration of Aggression		
	Physical	Verbal	Indirect	Physical	Verbal	Indirect
Malaria	.27 ***	.30 ***	.15 *	.18 **	.20 ***	.25 ***
Thyphoid Fever	.33 ***	.21 ***	.20 ***	.20 ***	.21 ***	.17 **
Yellow Fever	.34 ***	.24 ***	.27 ***	.20 ***	.16 **	.15 *
Cough and Flu	.28 ***	.31 ***	.21 ***	.30 ***	.24 ***	.24 ***

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

In order to illustrate the associations graphically, two examples are presented: the correlation between the frequency of suffering from yellow fever and the frequency of *victimization* from three types of peer aggression (Fig. 1), and the correlation between the frequency of suffering from yellow fever and the frequency of *perpetration* of three types of peer aggression (Fig. 2).

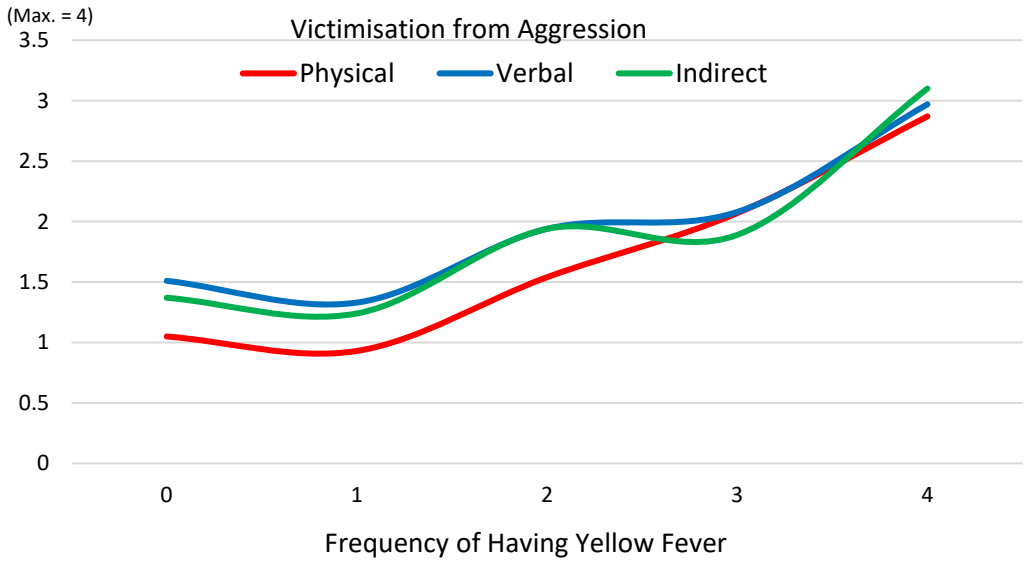

Fig. 1. Graphic presentation of the associations between how often the respondents have had yellow fever (0 = never, 4 = very often) and how often they have been victimized from physical, verbal, and indirect aggression by their peers (N = 283).

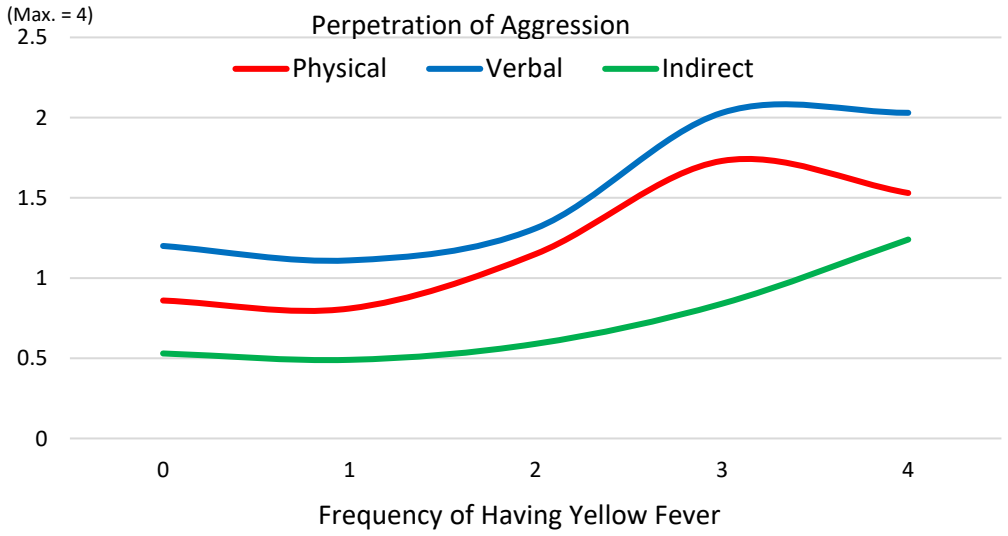

Fig. 2. Graphic presentation of the associations between how often the respondents have had yellow fever (0 = never, 4 = very often) and how often they have perpetrated physical, verbal, and indirect aggression against their peers (N = 283).

Discussion

The results of the present study indicate that there indeed is an association between the contraction of infectious diseases and both the perpetration of and victimization from peer aggression at school, at least in this Nigerian sample. The finding is novel, but it is supported by the previous study by Idro et al. (2010), which found malaria to be associated with behavioral problems.

However, it would be incorrect to draw any conclusions about cause and effect. It appears more likely to assume that the association is caused by a third factor, which increases the risk for both the contraction of infectious diseases *and* the development of aggressive behavior. It has been shown that overcrowding increases the risk of infectious diseases (Ghebreyesus et al., 2000; Krieger & Higgins, 2002) but also of antisocial behavior in a school context (Makinde et al., 2016; 2017). Overcrowding, which on hand leads to poor indoors air quality, on the other to stress on interpersonal relations, could therefore be one (but probably not the only) attributing factor to both problems.

References

[1] Bansal, R. K., & Saxena, D. M. (2002). Overcrowding and health. *Indian Journal of Medical Sciences 56,* 177–179.
[2] Bartlett, S. (1999). Children's experience of the physical environment in poor urban settlements and the implications for policy, planning and practice. *Environment and Urbanization 11*, 63–74.
[3] Björkqvist, K., Lagerspetz, K. M. J., & Kaukiainen, A. (1992). Do girls manipulate and boys fight? Developmental trends in regard to direct and indirect aggression. *Aggressive Behavior, 18,* 117–127.
[4] Blake, K. S., Kellerson, R. L., Simic, A., & Task, E. (2007). *Measuring overcrowding in housing.* US Department of Housing and Urban Development. https://www.huduser.gov/Publications/pdf/Measuring_Overcrowding_in_Hsg.pdf
[5] Clauson-Kaas, J., Dzikus, A., Stephens, C., Højlyng, N., & Aaby, P. (1996). Urban health: Human settlement indicators of crowding, *Third World Planning Review, 3,* 349–363
[6] Edwards, J. N., Fuller, T. D., Vorakitphokatorn, S. & Sermsri, S. (1994). *Urban sociology and community studies - household crowding and its consequences.* Boulder, CO: Westview Press.
[7] Elender, F., Bentham, G. and Langford, I. (1998). Tuberculosis mortality in England and Wales during 1982-1992: Its association with poverty, ethnicity and AIDS, *Social Science Medicine, 46,* 673–681.
[8] European Commission Data Protection. (2016). Rules for the protection of personal data inside and outside the EU. https://ec.europa.eu/info/law/law-topic/data-protection_en; 2016.

[9] Evans, G. W. (2006). Child development and the physical environment. *Annual Review of Psychology, 57,* 423–451.
[10] Finnish Advisory Board on Research Integrity. (2012). *Responsible conduct of research and procedures for handling allegations of misconduct in Finland*. Helsinki: Finnish Advisory Board on Research Integrity.
[11] Ghebreyesus, T. A., Haile, M., Witten, K. H., Getachew, A., Yohannes, M., Lindsay, S. W., & Byass, P. (2000). Household risk factors for malaria among children in the Ethiopian highlands. *Transactions of the Royal Society of Tropical Medicine and Hygiene 94,* 17–21.
[12] Gove, W. R., Hughes, M., & Galle, O, R. (1979). Overcrowding in the home: an empirical investigation of its possible pathological consequences. *American Sociological Review, 44,* 59–80.
[13] Guite H. F, Clark C, Ackrill G. (2006). The impact of the physical and urban environment on mental well-being. *Public Health, 120,* 1117–1126.
[14] Idro, R., Kakooza-Mwesige, A., Balyejjussa, S., Mirembe, G., Mugasha, C., Tugumisirize, J., & Byarugaba, J. (2010). Severe neurological sequelae and behaviour problems after cerebral malaria in Ugandan children. *BMC Research Notes*, *1*, 104
[15] Kearns, R. A., Smith C. J., & Abbott, M. (1992) The stress of incipient homelessness, *Housing Studies, 4,* 280–298.
[16] Krieger, J. & Higgins, D. L. (2002) Housing and health: Time again for public health action. *American Journal of Public Health, 5,* 758–768.
[17] Makinde, O., Björkqvist, K., & Österman, K. (2016). Overcrowding as a risk factor for domestic violence and antisocial behaviour among adolescents in Ejigbo, Lagos, Nigeria. *Global Mental Health*, *3*, e16, 1–9.
[18] Makinde, O., Björkqvist, K., & Österman, K. (2017). Mediating factors between overcrowding and adolescent antisocial behavior in Lagos, Nigeria. *Pyrex Journal of African Studies and Development, 3*, 24–30.
[19] Makinde, O., Österman, K., & Björkqvist, K. (2018). The association between sleep deprivation, aggression, and antisocial behavior in adolescents in Ejigbo, Lagos, Nigeria. *European Journal of Interdisciplinary Studies, 10*, 154–158.
[20] McNicholas, A., Lennon, D., Crampton, P., & Howden-Chapman, P. (2000). Overcrowding and infectious diseases - when will we learn the lessons of our past? *New Zealand Medical Journal 113*, 453–454.
[21] Sowunmi A, (1993). Psychosis after cerebral malaria in children. *Journal of the National Medical Association, 85,* 695–696.
[22] World Health Organization. (n.d.) https://www.who.int/ith/diseases/malaria/en/
[23] World Medical Association. (2013). Declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA, 310,* 2191–2194. https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/