The Relationship Among Social Support, Stress, and Inflammatory Markers in College
Undergraduates

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The relationship between psychological factors and the immune system is a relatively new area of study. Nevertheless, it has been found that significant relationships do exist among these variables; prolonged exposure to maladaptive forms of these variables may lead to the development or expression of inflammation. There is, however, a lack of studies that look at more than one variable in relationship to inflammation at a time. The current study examined the correlation among social support, stress, and inflammatory markers among college students. Using a sample of 46 college undergraduates from Southern Adventist University, survey results indicated a significant positive correlation between stress and inflammatory marker levels, with social support levels having a significant negative correlation towards both the other variables. These findings suggest that possessing a healthy social support system is an essential aspect of ensuring the integrity of college students' immune systems and their management of stress. The sources cited for the topic of this literature review were all peer-reviewed and gathered using EBSCOhost. The key terms used to search for the sources were *mood, stress, inflammation, inflammatory markers, IL-6, social support, susceptibility,* and *college students.*

Statement of the Problem

The purpose of this study will be to explore the relationship among social support, stress, and inflammatory markers in college undergraduates. This research study could benefit college students, especially those who struggle with stress management. This study could also benefit future researchers who are interested in this topic.

Subproblems

Six problems will guide this study:

1. The first subproblem is to measure students' levels of stress.

2. The second subproblem is to measure students' levels of social support.

3. The third subproblem is to measure students' levels of inflammatory markers.

4. The fourth subproblem is to examine social support, stress, and inflammatory markers as a function of gender.

5. The fifth subproblem is to examine social support, stress, and inflammatory markers as a function of class standing.

6. The sixth subproblem is to examine social support, stress, and inflammatory markers as a function of race.

Hypothesis

One research hypothesis will guide this study:

1. There will be a significant positive relationship between stress and inflammatory markers and a significant negative relationship between social support and inflammatory markers, as well as between social support and stress in students.

Null hypothesis: There will be no relationship among social support, stress, and inflammatory markers in students.

Research Questions

Six research questions will be addressed in this study:

1. What are students' average levels of stress?

2. What are students' average levels of social support?

3. What are students' average levels of inflammatory markers?

4. Are there stress, social support, and inflammatory marker differences as a function of gender?

5. Are there stress, social support, and inflammatory marker differences as a function of class standing?

6. Are there stress, social support, and inflammatory marker differences as a function of race?

Definition of Terms

The following terms are operationally defined for this study:

1. Participants' levels of social support will be measured using the self-reported scores from the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet & Farley, 1988). Items on this questionnaire will be measured on a 7-point Likert scale indicating to what extent they agree with a statement. Examples of these items include, "I get the emotional help and support I need from my family" and, "I can count on my friends when things go wrong."

2. Participants' levels of stress will be measured using the self-reported scores from the *Perceived Stress Scale* (PSS) (Cohen, Kamarck, & Mermelstein, 1983). Items on this questionnaire will be measured on a 5-point Likert scale indicating the frequency with which their thoughts or feelings agree with the given questions. Examples of these items include, "In the last month, how often have you felt that you were unable to control the important things in your life?" and, "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?"

3. Participants' levels of inflammatory markers will be measured using the self-reported scores from the General Toxicity and Inflammation Questionnaire (GTIQ) (Dupuie, 2014). Items on this questionnaire will be measured on a 5-point Likert scale indicating the frequency and severity with which they experience the given symptoms. Examples of these items include, "fatigue/low energy," "anxiety, fear, or nervousness," and, "headaches."

4. Gender will be measured using a segment of the demographic questionnaire that will be designed by the researcher. For example, Male=1, Female=2, and Other=3.

5. Class standing will be measured using a segment of the demographic questionnaire that will be designed by the researcher. For example, Freshman=1, Sophomore=2, Junior=3, Senior=4.

6. Race will be measured using a segment of the demographic questionnaire that will be designed by the researcher. For example, White=1, Black or African American=2, Hispanic or Latino=3, Asian=4, Native Alaskan or American Indian=5, Native Hawaiian or Other Pacific Islander=6, and Other=7.

Delimitations and Limitations of the Study

This is a limited, targeted, exploratory study on the relationship among social support, stress, and inflammatory markers in students at Southern Adventist University. There are 3 major limitations in this study:

1. Because a convenience will be used in this study, the results may not be representative of the student population at Southern Adventist University.

2. The sample size will not be large enough to allow for the generalization of these results to apply to other college campuses.

3. Because of the use of self-report measures, there is a possibility that participants will not answer items honestly or to the best of their ability.

4. Because of the limited resources and tools available during this time, the measures used in association with inflammatory markers may not be as reliable as those directly related to inflammatory markers such as IL-6 and TNF.

Assumptions of Study

Three assumptions are made explicit in this study:

1. This study has scientific merit.

2. The timeframe for completing this project is adequate.

3. Participants have a sincere interest in participating in the research study.

Importance of Study

The topic of the relationship among social support, stress, and inflammatory markers is important because if the results support the hypothesis, it could provide a means to improve or manage stress and inflammatory marker levels. This study could benefit people who interested in the influence of the mind on the body and vise versa, as well as researchers who are interesting in conducting future studies related to this topic.

Method

Participants

A minimum of 30 participants will be recruited using convenience sampling. All participants will be students at Southern Adventist University and be at least 18 years of age. The students will be recruited from several sites on campus such as the Student Center, the

Promenade, and McKee Library. The researcher will also recruit students from various

undergraduate psychology courses such as Personality Theories, Abnormal Psychology, and

History and Systems. As an incentive, all students will be offered cookies to participate in the

research study. The Ethical Principles of Psychologists and Code of Conduct of the American

Psychological Association will be followed regarding the treatment of all participants (American

Psychological Association, 2010).

Materials

The questionnaires used for this research study include: the *Multidimensional Scale of*

Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet & Farley, 1988), the *Perceived Stress*

Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), and the *General Toxicity and*

Inflammation Questionnaire (GTIQ) (Dupuie, 2014). In addition to this, the researcher will

create a demographic questionnaire to measure gender, class standing, and race. Each of these

questionnaires will be measured using the self-report method. The participants will be answering

questions regarding their demographics and levels of social support, stress, and inflammatory

markers to determine the relationships among all six variables. Aside from the demographic

questionnaire designed by the researcher and the GTIQ, all the other scales have been used in

previous studies. Among college students, the Perceived Stress Scale (PSS) (Cohen, Kamarck, &

Mermelstein, 1983) has high test-retest reliability (intra-class correlation=0.85), high internal

consistency (Cronbach's alpha's=0.84-0.85).

Design and Procedure

This study will be completed using a descriptive correlational research design using a

survey methodology. To obtain ample data, at least 30 students at the ages of 18 and older will

need to participate and complete the given questionnaires. Students will be enlisted by recruiting from various locations on Southern's campus including the Student Center, the Promenade, and McKee Library. The researcher will also ask permission to obtain participants from several undergraduate psychology courses including Personality Theories, Abnormal Psychology, and History and Systems. At all areas of recruitment, the researcher will approach students, introduce themselves and their purpose, and ask if they would be willing to participate in the research study as it is a part of the class requirements for the Research and Design Statistics II course. The researcher will then present the participant with the QR code for the questionnaires and the date by which it must be completed. All students will be informed that, by agreeing to participate in the research study, they will receive a cookie as incentive. The researcher will also answer any questions that potential participants may have without endangering the potential results of the study to be completed. The researcher will then thank the students who have agreed to participate and have them read and complete an informed consent form. The informed consent form will contain the researcher's email so that participants may ask any questions they have following their completion of the questionnaire. Once enough participants have been recruited, because of the electronic nature of the questionnaire, the researcher will then have only to wait until all results have been submitted. The first section of the questionnaire will be demographic in nature and created by the researcher regarding gender, class standing, and race. The second, third, and fourth section of the questionnaire will contain the *Multidimensional Scale of Perceived Social Support* (MSPSS) (Zimet, Dahlem, Zimet & Farley, 1988), the *Perceived Stress Scale* (PSS) (Cohen, Kamarck, & Mermelstein, 1983), and the *General Toxicity and Inflammation Questionnaire (*GTIQ) (Dupuie, 2014) respectively. The data gathered will then be scored,

coded, and entered into Statistical Package for Social Sciences (SPSS) (IBM Corp., 2016) to be analyzed.

Data Analysis

Following data collection, the questionnaires will be scored and coded using the appropriate answer keys and analyzed as follows using SPSS (IBM Corp., 2016):

1. Participants' levels of social support will be measured using the self-reported scores on the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988). The scores will be recorded using 7-point Likert scales, with 1 being the lowest value on the scale and 7 being the highest, that indicate how high or low social support levels are for each participant.

2. Participants' levels of stress will be measured using the self-reported scores on the *Perceived Stress Scale* (PSS) (Cohen, Kamarck, & Mermelstein, 1983). The scores will be recorded using 5-point Likert scales, with 1 being the lowest value on the scale and 5 being the highest, that indicate how high or low stress levels are for each participant.

3. Participants' levels of inflammatory markers will be measured using the self-reported scores on the *General Toxicity and Inflammation Questionnaire* (GTIQ) (Dupuie, 2014). The scores will be recorded using 5-point Likert scales, with 0 being the lowest value on the scale and 4 being the highest, that indicate how high or low inflammatory marker levels are for each participant.

Demographic variables will be coded as follows:

1. Gender: Male=1, Female=2, Other=3

2. Class standing: Freshman=1, Sophomore=2, Junior=3, Senior=4

3. Race: White=1, Black or African American=2, Hispanic or Latino=3, Asian=4, Native Alaskan or American Indian=5, Native Hawaiian or Other Pacific Islander=6, and Other=7

Results

The results of this research study are expected to reject the null hypothesis and, thus, support the alternative hypothesis which states that there will be a significant positive relationship between stress and inflammatory markers and a significant negative relationship between social support and inflammatory markers, as well as between social support and stress in students. This would suggest that high levels of social support have the potential to act as a defense against high levels of stress and inflammatory markers among college students. The data may also result in a difference among social support, stress, and inflammatory markers on the basis of gender, class standing and race.

Discussion

Should the results of this research study support the alternative hypothesis, and students with higher levels of social support do have lower levels of stress and inflammatory markers, then this information will be of use to the students at Southern Adventist University. This data could benefit individuals who struggle with chronic inflammation or stress management, and it may also benefit future researchers interested in this subject. Future research could include multiple campuses across the country, greater diversity among participants in terms of race and religious affiliation, a larger sample size, and a method of sampling other than a convenience sampling.