

Chapter 1

Using Natural Language Processing Techniques to Assess the Attitudes of Nursing Students During the COVID-19 Pandemic

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ABSTRACT

COVID-19 pandemic has a significant impact in the world. It has led to different measures taken by governments to prevent its spread, such as school closures, employment of e-learning, and complete lockdowns. Together with the pandemic, these measures also affected many people, economically and psychologically. This chapter assesses the attitudes of undergraduate nursing students in Turkey during the COVID-19 pandemic, using automatic natural language processing (NLP) techniques. NLP is a branch of artificial intelligence, and it facilitates automatic analysis of natural language texts. Machine translation and sentiment analysis are among significant NLP techniques. Data collection is performed using an online questionnaire, filled by 101 students from three different universities in Turkey. Machine translation is used to translate responses of the students to English, and then sentiment analysis is performed on these translations. The sentiment analysis results can be used by related nursing educators and health professionals.

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INTRODUCTION

At the time of writing this chapter, the novel Coronavirus Disease 2019 (COVID-19) pandemic is still effective all over the world. This global pandemic has started in 2019 and since then it has affected all individuals and countries in the world. Lockdowns, school closures, using masks and complying with the social distancing rules are among the measures proposed and applied to decrease the negative effects of the pandemic. Remote education and remote working have become widespread. Many health professionals and scientists have worked hard to treat the infected and develop vaccines and drugs against the disease. Vaccines against COVID-19 have emerged at the end of this endeavor. The aforementioned change in the education and working style have been considered positively by some of the people concerned while some people have considered these changes negatively.

The aim of this study is to use automatic natural language processing (NLP) techniques to assess the attitudes of nursing students towards the COVID-19 pandemic and nursing profession at the initial stages of this global pandemic. NLP is a significant branch of artificial intelligence (AI) with application opportunities in diverse domains (Chowdhury, 2003, Jurafsky and Martin, 2020). NLP, and hence AI, is increasingly being used by recommender systems, in healthcare applications, in information retrieval systems, and in finance applications, among others. It is known that automatic NLP methods can be used to improve public health surveillance on the Web and other textual health-related sources (Natsiavas et al., 2016; Küçük et al., 2017; Baclic et al., 2020).

In this book chapter, the data is obtained online from 101 undergraduate nursing students between May 21, 2020 and July 5, 2020, with a questionnaire of open-ended questions published on Google Forms¹. The questions (in Turkish) are about the opinions of the students regarding the recent COVID-19 pandemic, their coping strategies with stress during the pandemic and their personal development strategies, as well as their ideas regarding the nursing profession.

Within the course of this study, various NLP techniques are applied to the collected data (in natural language) in order to automatically extract the sentiments of the students towards the pandemic and towards the nursing profession alike.

Hence, an important NLP task considered in the current study is sentiment analysis (opinion mining) which estimates the opinion of a text owner (using the text) as a classification output in the form of these polarity classes: Positive, Negative, and Neutral (Feldman, 2013; Hemmatian and Sohrabi, 2019). We have used a high-performance sentiment analyzer for English texts (Hutto and Gilbert, 2014) for this purpose. However, before sentiment analysis, we have used another NLP technique, machine translation, to translate our original texts in Turkish into English. For this purpose, Google Translate (Wu et al., 2016) is employed.

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