

## **Abstract**

In recent years, there has emerged a new trend focused on the body image in the Western countries. Our society is concerned with people's physical appearance and ideal body image. As consequence of this trend, two businesses emerge: fitness centers and the plastic surgery clinics. Traditionally the consumer's expenditure in these services and goods has been considered a luxury especially during the economic slowdown. However, in the recent times, (at end of 2000s they are showing an increasing trend in terms of activity and business size). Thus, customers have seen the practice of fitness and plastic surgery procedures as a necessity rather than a luxury.

In this context, we find out people try to replace their well-being falling into loyalty consumers these goods and services. In particular, under forty years old males increase their gym practice in order to improve their body image for both, their personal self-esteem and their sexual appeal. On the other hand, we have observed the emergence of plastic surgery practice between women due to the social pressure, ideal body image propagated by media and economic affordability of these procedures. As a results, the aim of this thesis consist of developing two discrete epidemiological mathematical models to study the aggregated behavior of population who practice fitness and also a second model for those who undergo plastic surgery procedures. The first part of the thesis focuses on forecasting the proportion of males' fitness consumption in Spain in the next years. Economic and psychological motivations are taken into account in order to quantify the dynamic behavior of men gym users.

The second part of the thesis is focused on the study of plastic surgery practice among women, a consumption that grows continuously in Western countries due to body image dissatisfaction, aging anxiety and the ideal body image propagated by media. The growth of plastic surgery consumption is so important that it is becoming a normal practice among women, like any other cosmetic product, with the risk of suffering psychopathology disorders in the sense that plastic surgery can be applied as an instrument to recover personal self- esteem, or even happiness.

In this framework, we develop an epidemiological mathematical model to forecast the

female plastic surgery consumption in Spain. The main factors taken into account are economic, demographic and social ones. Once the model is fully constructed, population of over- consumers is predicted and simulated. Then, the robustness of the model is studied. Finally, after modeling and simulating both models, results are discussed and conclusions of the thesis will be commented.