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Demand for specific cosmetic surgery procedures in a South African hospital

Sarel Gerhardus Koekemoer

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

More people worldwide are becoming open to the idea of having a cosmetic procedure, in one form or another, and part of this study was to gain insight as to whether South Africa is following this global trend.

The study found that the market for male cosmetic surgery is below three percent and not showing any signs of growth; the market for white female patients is by far the biggest segment and shows the same signs of decline as the other two racial groups. As expected, the list of most popular procedures for Gauteng looks very different to that of the overseas market. This study showed that the top four procedures are breast enlargement, liposuction, breast reduction and tummy tuck. South Africa is a diverse country with many cultures and each has a different idea of what is deemed attractive, so the results of the most popular procedures vary for the different cultural groups within this population. In order to cater to the needs of such a diverse customer base, facilities will have to start segmenting their markets more clearly.

Of all the external economic data tested against the demand for cosmetic surgery, CPI was found to have the most significant impact on the demand for cosmetic surgery in Gauteng. The Gauteng market for cosmetic surgery is thus sensitive to the change in cost of living for the average household.

Another external factor that proved to have a significant effect on cosmetic surgery demand was the economic status of a sample taken from within the population. It was found that customers from more affluent areas are spending the most on cosmetic surgery in Gauteng.

This study has thus showed that changes in CPI figures and overall personal wealth influence the demand for cosmetic surgery in general, while the choice of surgery was shown to have influences that are more personal.

DECLARATION

I, Sarel Koekemoer, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Sarel Gerhardus Koekemoer

Signed at Parktown, Johannesburg

On the 1'st day of November 2013

DEDICATION

I would like to dedicate this project to three people in particular: My grandfather, Stephen Armond Van der Walt; my father, Sarel Gerhardus Koekemoer; and my wife, Lome Koekemoer.

My dad and granddad are men who have taught me what it means to be a man of principle, more by way of example than by words. They are men who know that the greatest calling in life is to provide a solid foundation for your family to thrive on. They understand hard work and dedication in a way that would humble the average man. They are extra-ordinary men in its true form.

I would have liked to share this moment of personal triumph with my grandfather in person, but I know that his pride will transcend the boundaries of this world. To you, granddad, I would like to offer my utmost gratitude for the immeasurable patience with which you taught me some of the most valuable lessons in life that I have ever had the privilege of learning. I can only hope that I can be half the man you were in life and I truly miss your absence in death.

To you, dad, I would like to say that none of what I have ever achieved would have been remotely possible if I did not have you as a shining example of what can be done, even if your circumstances offer you very little opportunity for success. You are one of the most successful people I know, not because of what you have achieved in worldly terms, but because of how much you have achieved since you started out. The humility with which you sacrifice your time and energy to all around you is an inspiration that forces me to want to be better. I have always wanted to make you proud, and I hope that my small achievements are a few steps in the right direction.

My wife is a woman who knows what it means to believe in something and how to put her head down and work for it. She is the one person who has never doubted my ability to finish what I started, and her belief gave me the courage to stay on course. To you, gorgeous, I want to offer my condolences for being stuck

in the same house with me over the past few months and for being the one who had to absorb my frustration. You were my rock during this time and I need you to know that I will always seek to be a better husband and friend to you. My vow to love you and care for you remains as strong as the day I made them and I love you with all my heart.

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I would like to acknowledge that in my own capacity there is nothing that I can achieve, but through my creator, I am capable of anything! Thanks to my Lord and Saviour for the ability He has given me to complete this task.

I want to thank my wife, Lome Koekemoer, for her unfailing support and her ability to remain my biggest supporter throughout this project. “Dankie Ou Vrou!”

To my parents, thank you for always being there to listen when I need to talk and thank you for being truly interested and invested in what I do. You made me who I am and there is no word of praise that can repay that, so I can only hope that my triumphs make you proud.

A very big thanks to a very special person, Retha Zeelie. You were there on the day that Lome and I decided I would take on this challenge and you ensured that I accepted it without reservations. You also showed me the true meaning of the word selflessness and I thank you for your very big part in this chapter of my life. I have no doubt that there will be many more to share.

To all my friends and family who never failed to remain curious about my progress throughout the last 3.5 years: thank you for your support! Thank you for not forgetting about me in the times when I was forced to forget about you so that I could study!

I would also like to thank Hennie Gerber for his considerable time and effort to help me with the statistical side of my research. Your calm demeanour in a time when I was frantic to get the work done kept the thinking behind the stats sober and ensured a better result. Thank you for your valuable input and help!

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for your valuable input and for getting on board so quickly to help. Your advice kept my research firmly rooted in the realm of reality.

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A great big thank you must lastly go out to Angie Urban who proofread and edited this document countless times without complaint and in a professional manner. She is a master of her craft and I thank her for helping me to turn my research into a proper piece of academic literature.

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1 INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to identify some of the factors that affect people's decisions on whether to have cosmetic surgery at a hospital in Johannesburg, South Africa (SA). The various factors that were evaluated could shed some light on the possibility of predicting future demand of certain cosmetic procedures in a South African context.

1.2 Context of the study

More people worldwide are being exposed to positive media images about this industry, relaying a message of a larger inclusive market (Delinsky, 2005). This has begun to change people's perceptions about having cosmetic surgery as people from all walks of life now have access to cosmetic surgery (Delinsky, 2005).

In a country like SA, however, where almost 40 percent of the country's population does not even have access to a flush toilet, it will be a large stretch of the imagination to assume that cosmetic surgery is accessible to the majority of the population (Stats SA, 2007). This does not take away from the fact that more people worldwide are becoming increasingly open to the idea of having a cosmetic procedure in one form or another and part of this study was to gain insight as to whether SA is following similar global trends.

The media, for example, is filled with stories that claim how trends are changing in cosmetic surgery where younger people are more inclined to have surgery due to the image of their idols that they wish to emulate (Markey & Markey, 2010). Reality television programs are becoming an accepted part of young people's lives and they are thus continuously exposed to images of what the world deems beautiful, whether it is accurate or not (Markey & Markey, 2010). The

psychological reasoning behind why young people might want to alter their appearance is sound, but is this changing demographic also applicable in SA?

In SA, there has been the emergence of a black middle-class with increasingly more disposable income. In 2006, the Unilever Strategic Marketing study identified a black middle-class, which they termed the 'Black Diamonds', who represents an annual spending power of 25 billion US dollars (Olivier, 2007). Although this group consists of approximately two million people (only four percent of SA's population), their buying power cannot be ignored even though marketers have historically neglected them (Olivier, 2007). Due to this trend over the past decade, it is imperative to evaluate whether an increase in black patients opting to have cosmetic surgery is occurring within a South African context.

The demand for cosmetic surgery in the United States of America (US) increased until the year 2000, reaching a total of 1.9 million cosmetic surgeries performed annually, and remaining in the top spot for the country with the highest number of annual cosmetic procedures performed (CPSS, 2011). This growth clearly showed the potential power of the industry. Even during the start of the recession, the decline in the number of procedures performed was not very dramatic. In 2011 the American Society of Plastic Surgery released their annual report for 2010 showing the first year-on-year growth in the number of procedures since the start of the recession (CPSS, 2011). From 2000 to 2010 the industry showed a total decrease in demand of 17 percent, which is not significant considering the general economic climate during this time (CPSS, 2011). With figures on the rise, it is safe to assume some growth in this industry.

Another factor that has contributed to the demand for cosmetic surgery is the increase of cheaper non-surgical cosmetic procedures. The number of minimally invasive procedures performed in the US has grown by 123 percent from 2000 to 2011, showing no symptoms of recession (CPSS, 2011). Of all cosmetic procedures performed in the US during 2011, 88 percent were non-surgical

(CPSS, 2011). This is interesting because the industry for non-surgical procedures was almost non-existent 15 years ago.

Cosmetic surgery is an industry that sits on the boundary between the medical field and the market for high-end products. It is a cash purchase firmly rooted within the changing environment of medical science, and this unique position makes this industry an interesting subject for study. The most interesting thing about cosmetic surgery, when looking at it from a business point of view, is that it is perhaps the only field of medicine that adheres to basic economic principles, because transactions are cash the industry has to abide by the rules of supply and demand (Krieger & Shaw, 2000). This means that a study of basic economic indicators and the effect it has on the incidence of cosmetic surgery procedures should reveal a correlation (Duncan, Ho-Asjoe, Hittinger, Nishikawa, Waterhouse, Coghlan, & Jones, 2004). The knowledge gained from a study of changing demand factors and its effect on the cosmetic surgery market should generate some highly valuable knowledge for local surgeons navigating a medical practice in difficult economic waters.

Thus, this study has paved the way for research into the various factors that affect demand for cosmetic surgery in SA so that not only can the market be better understood, but surgeons can start to adapt their management and marketing practices accordingly.

1.3 Problem statement

1.3.1 Main problem

To assess some of the factors that influences the demand for cosmetic surgery in a South African hospital.

1.4 Significance of the study

There are currently very few studies in the field of cosmetic surgery in SA in general. Information regarding the changes in the profile of a cosmetic surgery customer, for example, abounds in the media, but is very seldom based on scientific data. This study has added some valuable statistics to the research on cosmetic surgery and its demand in SA.

Furthermore, this study provided some guidance to cosmetic surgeons looking to understand the demand for their services in an ever-changing South African economic environment. The nature of cosmetic surgery industry makes it volatile and thus sensitive to change. If these surgeons could have some idea of what the potential increase or decline in the demand for their services will be, then they might be able to prepare to meet that demand or buffer themselves against the effect of a decline.

1.5 Delimitations of the study

The variables that were used in the study were limited to gender, race, suburb, price and choice of surgical procedure. The database from which the data was retrieved could not provide patient age or income group, which would have increased the scope of this research.

The cosmetic surgery procedures that were considered were limited to a list of the surgical procedures provided at the hospital from which the data was gathered. These procedures are not a list of the most popular procedures around the world, but are based on the figures of the specific hospital used for this study. Non-surgical cosmetic procedures have been excluded from this study. The data used in this study was drawn from a single hospital in Johannesburg where cosmetic surgeries are performed. This study will not attempt to design any economic model that might be used to predict future demand of cosmetic surgery.

The main data is made up of a list of cosmetic procedures performed at a specific hospital over a 24-month period. Earlier records were not available as the hospital was using a different customer relationship management system from which these records could not be drawn electronically, therefore, a longer time range was not possible.

The time range of the data falls within a time of recession, which provided some interesting insights, but made it more difficult to compare with other research in better economic times.

1.6 Definition of terms

In this study the term ‘cosmetic surgery’ refers to surgical procedures that are not seen as re-constructive in nature, and can therefore not be viewed in the same light as cosmetic surgery cases performed on patients who have some kind of deformity or physical disability. Re-constructive surgeries performed by plastic surgeons are essential operations where the patients usually do not have a choice, and these operations are paid for by the patient's medical aid. Non-essential cosmetic surgery is always a choice that a patient makes due to a personal conviction or justification, and it is only available to those who can afford it.

Breast augmentation is the surgical procedure where a woman receives silicone breast implants to enhance the size and shape of her breasts.

Abdominolipectomy is the name for the surgical procedure more commonly known as a tummy tuck.

1.7 Assumptions

It is assumed that all the people in this study had access to the same amount of information regarding the specific procedure in which they were interested. The hospital, whose data was used in this study, provides brochures to all their

patients, as well as free access to a registered nurse with whom they can discuss their questions and concerns. Therefore, it is assumed that all the people included in this study made an informed decision about the specific procedure they wanted to do.

It is assumed that the data provided by the hospital is correct and includes no double entries. Sometimes it may occur that information management software systems produce more than one record of the same person, which could severely skew the results of this research. An electronic duplicate check was done on the data before it was used for this study, which should limit this probability to an acceptable minimum.

2 LITERATURE REVIEW

2.1 Introduction

The idea of having cosmetic surgery has evolved from being an exclusive privilege reserved for the rich and famous to a possibility for even the middle class. The chances are good that most middle-class citizens now know at least one person in their lives who have had some form of cosmetic surgery. During 2001 the US experienced a record low unemployment figure due to the first stages of the recession, while the number of cosmetic surgery cases remained stable at 7.5 million procedures performed (Radocha, 2002). This showed that people considered cosmetic surgery even though the economy was entering a downturn. By 2009, however, the emerging middle class were spending much less in general, cosmetic surgery was not immune to the woes of the economy (CPSS, 2011). The American Society for Aesthetic Plastic Surgery (ASAPS) revealed that Americans spent 17 percent less on cosmetic surgery compared with 2008 (CPSS, 2011). Despite this decline, cosmetic surgery has become a worldwide industry that serves millions of people every year. The fact that the number of procedures being performed worldwide was reducing should not draw any attention away from the growth the industry showed. From 1997 to 2002 the market for cosmetic surgery in the US grew by 228 percent, which gives an indication of the possibility for future growth that this industry represents (Delinsky, 2005).

This report aimed to provide a brief overview of the main areas of research that have already been done in this field to try to capture a sense of the typical cosmetic surgery customer and the factors that influence their decision to have a non-essential operation. Although there are multitudes of factors that play a role, the factors that will be focused on in this study will be limited to a smaller group that represents the major areas of demand found in the literature.

The majority of SA's population still live in poverty, but an emerging middle class has developed over the past decade with an increasing number of people having access to better jobs and more money (Olivier, 2007). It is therefore logical to assume that these people might consider spending their money on cosmetic surgery. If this is the case, then what does the cosmetic surgery market in SA look like? Can the profile of the average cosmetic surgery shopper be predicted? Are the demand factors of the average cosmetic surgery shopper changing due to external circumstances? Does a person's background dictate the choice in surgery that they choose, or can the state of the economy ultimately predict whether a person will go through with his or her surgery? Unfortunately, very little (if any) research has been done in SA to answer these questions and these form the basis of this research.

2.2 Factors affecting a person's choice of cosmetic surgery

It is strange to think that a medically healthy person would go through a dangerous medical procedure because they feel that their body needs to be altered to fit a specific notion of what is beautiful to society. The question of what influences a person to have a non-essential invasive surgical procedure that is both painful and expensive is not an easy one to answer. The psychological, social and cultural issues alone will command a lot of information and then only scratch the surface. Lirola and Chovanec (2012) argue that the current ideology in society provides a more than suitable backdrop for women and men to take their image into their own hands by trying to become the perfect picture that is presented as the ultimate. With the vast amount of media to which most people are exposed, it is difficult to differentiate between a sense of individuality and the picture that has been subconsciously formed over time. The decision to have cosmetic surgery is thus not just a physical and financial one, but also a very real psychological process (Lirola & Chovanec, 2012). It is thus important to look at all these factors when evaluating the driving forces behind the market for cosmetic surgery.

A few specific variables have started to stand out as the commonly accepted reasons why cosmetic surgery has grown so tremendously and enjoyed such a rapid rate of increased acceptance in the eye of the public. These factors include: the various technological advances in the field, people having access to more money, reduced cost of surgery, higher focus on self-image and beauty, and increasing media exposure/coverage (Henderson-King & Henderson-King, 2005).

Another study, conducted in Eastern Austria, looked at a more comprehensive list of possible factors affecting people's decisions to have surgery in order to find out which of these factors most affected the likelihood of respondents having cosmetic surgery (Swami, Arteche, Chamorro-Premuzic, Furnham, Stieger, Haubner, & Voracek, 2008). They looked at factors such as media-exposure to messages about cosmetic surgery, personal and vicarious experience with cosmetic surgery in the past, self-ratings of attractiveness and demographic variables such as age, race, gender, height, Body Mass Index (BMI), highest level of education and marital status (Swami et al., 2008). The most significant finding of this study was that people who have had personal experience with cosmetic surgery in the past are most likely to consider it again in the future. It was also confirmed by this study that women in general are much more likely to have surgery than men (Swami et al., 2008). An interesting finding of this study was that greater media exposure made people even more likely to accept the idea of cosmetic surgery when they then encounter people who have had surgery. It can be hypothesized that this phenomenon occurs because the additional exposure breaks down people's bad perceptions and the stereotypes that they created in their mind of cosmetic surgery (Swami et al., 2008).

Cosmetic surgery is a very young field and a cosmetic surgery culture is only now starting to emerge in people younger than 35, where it is seen as acceptable and even desirable to have cosmetic surgery (Berer, 2010). Previous generations have viewed cosmetic surgery as a vain pursuit reserved for celebrities (Khammissa, Feller, Altini, Fatti, & Lemmer, 2012). Due to this emerging culture, a few interesting phenomenon have started to emerge: more

men are becoming aware of the benefits of cosmetic surgery and more children under the age of 18 are having surgery (as much as 15 percent of the market in Brazil) to name but a few (Khammissa et al., 2012).

It has been shown that exposure to positive media messages about cosmetic surgery, having a friend or relative who had a positive experience with cosmetic surgery, body dissatisfaction, high BMI scores and materialism are a few of the more well-known reasons why people have cosmetic surgery (Campana, Ferreira, & Tavares, 2012). There are thus numerous reasons why people consider surgery, but what about the reasons not to have surgery? A study done at UCLA found that fear of a poor outcome was by far the biggest reason why people might choose not to go through with surgery, and for this reason it was important for them to know whether the surgeon they are considering is board certified and has a good reputation (Galanis, Sanchez, Roostaeian, & Crisera, 2013).

In this age, it is not just enough to be informed of things once they have happened, but as they happen. This has sparked an industry for technology called Social Media. Research done in Washington showed that even cosmetic surgeons are now utilizing social media to gain referrals, where 28 percent of the doctors in the survey actively use it in their practice for this purpose (Wheeler, Said, Prucz, Rodrich, & Mathes, 2011). With the increase in the use of social media and technology among young and old, it will become an increasingly important factor in the decision making process of cosmetic surgery patients. With a site such as Facebook, boasting 750 million active users, it is not difficult to see the importance of online media in marketing for cosmetic surgery. Many studies have shown that the current profile of cosmetic surgery patients is a younger, employed and educated shopper (Camp & Mills, 2012). This coupled with the psychology of social pressure and the access to information, it is clear that the array of influences on buying behaviour in today's world is vast.

Looking at the various articles published on the subject, it would be folly to try to discuss all the factors affecting a person's decision to have cosmetic surgery.

Age, gender, race, social status, income, psychological state, economic conditions and media exposure are but a few of the elements that make up the scope of influences affecting people's choices when considering a purchase decision that has such a personal impact. Therefore, this study focused on as many of the more important factors as possible to try to create a true representation of the process behind a person's choice of having cosmetic surgery.

2.2.1 Gender

Cosmetic surgery has always been an industry utilised predominantly by women, with only a small amount of men having surgery (Davis, 2002). As early as 1995, well-known feminist author Kathy Davis started to question the concept that cosmetic surgery was just a matter of personal choice and consumer behaviour (Davis, 2002). She realized that a large number of influences, outside of the normal spectrum of consumer behaviour, impacted on a women's motivation to have cosmetic surgery (Davis, 2002). She argued that it was the influences of a male dominated western culture and its views of women that pushed women to consider cosmetic alterations and it is for this reason that female consumers dominate the market (Davis, 2002). By 1998, however, 10 percent of cosmetic surgery cases in the US were performed on men, and it was steadily increasing (Davis, 2002). An article published by Davis in 2003 clearly portrayed a strong view on this rising male section of the market, and she emphasized that, despite this trend, the cosmetic surgery market will always remain a female-dominated market (Davis, 2002).

As early as 1994, the term metrosexual started to emerge which was used to describe the growing number of men who are concerned about their appearance and who are willing to take up cosmetic alternatives to help maintain their appearance (Elsner, 2012). The market for cosmetic procedures on men is thus growing at a steady pace, but remains far behind the market for female procedures.

A study done in Brazil among male and female patients found that women were inclined to see the positive gains of having cosmetic surgery, with less focus on the side effects and risks. Whereas men had a more practical approach, being concerned about the side effects and risks, which contributed to the fact that less men were ultimately having surgery (Campana et al., 2012). The study also showed that women felt much higher levels of pressure to conform to media messages showing the perfect body, than men did. Women are thus more willing to accept the possible side effects of the surgery than men are due to the perceived benefits (Campana et al., 2012).

Any study of the change in the demand distribution of cosmetic surgery between male and female patients over time will reveal a great deal about the culture of the environment specific to that study. Whatever the psychological reasoning behind the choice, women and men of all cultures have various pressures on them that will be unique within each country. In 2004, the first large scale study reporting the demographic variations in patients of a cosmetic surgical institution over a specific time period was done in the United Kingdom (UK) to see whether the ideas portrayed in the media of changing demographics in this industry were accurate (Duncan et al., 2004). They found that large-scale demographic shifts in gender and patient age were not occurring as drastically as the media had suggested (Duncan et al., 2004). The public perception created by the media at that time in the UK was that an increasing number of males were having cosmetic surgery, and that the average age of cosmetic patients were reducing (Duncan et al., 2004). The research showed that this was in fact not the case for this specific institution in the UK (Duncan et al., 2004).

From the discussion above, it should be noted that gender variances in cosmetic surgery were constant in the UK from 2003 to 2004, while during the same period it was changing in the US (Davis, 2002; Duncan et al., 2004). This discrepancy points towards a different set of historical, cultural and environmental factors in these two countries, which would lead to different perceptions and attitudes toward cosmetic surgery. Variables, like age and gender, will essentially be unique for different regions and should be viewed in

isolation. Any conclusions drawn from research on these variables should thus always be discussed within the unique context of the general geographical location of the sample or population.

2.2.2 General media and social media

There are factors that seem to transcend the borders of nations to have a similar effect on people across the world. One of these factors, which have been shown to have an increased influence on people's attitudes toward cosmetic surgery, is the effect the media has on people's perceptions of various stereotypes (Delinsky, 2005). In 2005, a study was done among 302 female psychology students at a university in the US. The aim of this study was to find out whether increased exposure to media messages regarding cosmetic surgery had any effect on their attitudes toward the idea of having surgery in the future (Delinsky, 2005). Although the majority of these students viewed cosmetic surgery in a slightly negative way, it was shown that increased exposure to positive messages about cosmetic surgery increased the respondent's level of acceptance toward the idea of cosmetic surgery (Delinsky, 2005). Furthermore, the students who had somebody close to them who had undergone cosmetic surgery had a much higher acceptance of surgery and a positive attitude towards it (Delinsky, 2005). It is safe to assume that any person with the means to pay for cosmetic surgery will surely have access to the Internet and other sources of information. Due to the easy access to news and information, it can be expected that this trend of affecting attitudes toward surgery via positive media exposure will continue to grow and develop. If the size of the industry and its growth is any indication, then more and more money will be spent to create a positive report around cosmetic surgery in the media.

It is thus imperative to investigate further the influence of the media on perceptions about cosmetic surgery. It is not merely the media's direct effect on people's pre-conceptions, but also a secondary effect when people are confronted with other influential factors that might possibly change their view on this subject. The way in which cosmetic surgery is being portrayed by the media

also has an effect on the self-confidence of younger people in various ways and cannot be ignored (Markey & Markey, 2010).

People compare themselves to the examples of the ideal image presented by the media. The biggest problem with this is that the vast majority of men and women will never be able to attain that perfect image. Inevitably, this results in a reduced satisfaction with one's own body, and can ultimately lead to depression (Markey & Markey, 2010). For a lot of people who are considering cosmetic surgery, this is the main reason they are looking to improve their appearance (Markey & Markey, 2010).

The vast influence that social media is also exerting on the world of marketing cannot be ignored. Patients are using social media more and more to share the experience of their surgery with family and friends (Camp & Mills, 2012). It can cause people to be more open to the idea of having surgery themselves when a friend has had a positive experience that they have posted on Facebook. It can also create scepticism and fear among potential patients when a friend or family member is very vocal on their social media platform about a bad experience that they have had (Camp & Mills, 2012).

2.2.3 Social versus personal motivational factors

In 2004 Henderson-King and Henderson-King (2005) did a series of four studies aimed at developing a scale that would help predict a person's acceptance of cosmetic surgery on both a social and intra-personal level. The basic premise of this research was based on the theory that people choose to have surgery for one of two reasons: social – so that they may feel less self-conscious in social circumstances; and personal – so that they may feel good/better about themselves (Henderson-King & Henderson-King, 2005). These studies revealed that a much higher proportion of people reported to have had cosmetic surgery based on personal reasons, rather than social ones. These findings make it clear that psychological factors have a very high impact on a person's acceptance of cosmetic surgery. Although social pressure on its own is not the main driver in

this instance, it must be said that it has a large compounded effect on a person's existing self-confidence, or lack thereof. This indicates that people are much more inclined to have cosmetic surgery now because they are scared of the image they might have in the future, rather than to enhance their current image (Henderson-King & Henderson-King, 2005).

2.2.4 Income

A seemingly logical idea is that cosmetic surgery can only be considered by someone who can afford it. A further possibly logical assumption would be that the higher a person's income, the more likely they are to consider having cosmetic surgery when confronted with the option. Income is, in fact, not a good predictor of cosmetic surgery demand. The reason for the uncertainty is the increase in the number of people from lower social classes who are having cosmetic surgery. Cosmetic surgery is not only undertaken by wealthy patients anymore (Wong, Moledina, & Park, 2007). In 2006, a study was done in Warwickshire in the UK, which concluded that an increasing number of women from lower social classes have had cosmetic surgery during the preceding four years. This clearly showed that other factors must be considered in association with income, due to the diminishing correlation between the incidence of cosmetic surgery and the earning potential of the patient considering surgery (Wong et al., 2007).

Consumer wealth (the Nominal House Price Index) is by far a better predictor of cosmetic surgery demand (Wong, Sanger, Marcum, Forsberg, David, & Marks, 2011). This is consistent with the research mentioned earlier. It is therefore important to throw out any logical inferences that can be made in order to examine the facts and look at all the indicators, which might help to provide insight into the market for cosmetic surgery.

2.2.5 Medical tourism

Access to cosmetic surgery has increased worldwide due to a trend that started as early as the 1980s in Asia, called ‘medical tourism’ (Connell, 2006). Many of the richer countries of the world have one thing in common: healthcare is expensive. This fact, coupled with the fact that most people in these countries can afford to pay for alternative sources of care, has opened up an entirely new industry where countries known for their tourist attractions have started to market the lower cost of certain surgical procedures coupled with a holiday experience. The total cost of a trip to a well-known tourist destination, along with a planned surgical procedure can potentially cost a person less than the cost of just having surgery in countries like the US, UK and Germany. The bulk of this industry has been focused around cosmetic surgery, dental surgery and major heart surgery (Connell, 2006). Thailand, Malaysia, India, Singapore and even SA have proven to be destinations visited by medical tourists with the bulk of these patients going to facilities in Asia and India (Connell, 2006). Historically, countries with low healthcare costs are not necessarily known for the quality of their services, but this has changed dramatically since the start of this industry, and these countries now boast world-class facilities and doctors aimed at the international patient. Certain countries have also begun to specialise in certain procedures in order to have a competitive edge, such as the lower cost of open-heart surgery in India when compared with anywhere else in the world (Connell, 2006). Other factors, such as long waiting lists for certain medical procedures and the benefit of anonymity for more sensitive cosmetic procedures are also fuelling the industry (Nicolaides, 2012). Those countries that have managed to create a fertile environment for medical tourism, such as Asia and India have increased their general tourism income as a result. SA also has the quality medical facilities and the unique getaway opportunities that can make it a top destination for medical tourism, but has struggled to embrace this new industry (Nicolaides, 2012). There is thus a big market for future development in SA.

2.2.6 Age

Probably one of the most disturbing facts about cosmetic surgery consumers is the steady shift towards a younger clientele. During 2009, over 200 thousand young people between the ages of 13 and 19 had cosmetic surgery in the US alone (Maltby & Day, 2011). This shows that a large market segment for cosmetic surgery exists within a much younger demographic than one would expect to find in this market. Although the percentage of children under 18 years who are having surgery in the US remained at a constant two percent of the total market, the number of surgeries being performed is growing along with the market (Larson & Gosain, 2012). For these young people there must be a very strong reason, or combination of reasons, for them to choose to have elective surgery at such an early age, while convincing their parents to pay for these procedures if they do not have access to funds themselves. Most adults would probably not expect children to have a big enough issue with their appearance to want to undergo surgery in the first place.

One of the major emerging factors for why these young people have undergone surgery is the influence of celebrities on the child's self-image. Previous research in the UK has found that young people who take part in any form of celebrity worship tend to show a higher willingness to undergo cosmetic surgery (Maltby & Day, 2011). Maltby and Day (2011) conducted a study in 2010 to try to find out whether celebrity worship among young adults could predict the incidence of cosmetic surgery in some way. They found that intense personal celebrity worship did indeed predict the incidence of elective cosmetic surgery in their sample of young adults between the ages of 18 and 23 (Maltby & Day, 2011). Due to the characteristics of this stage of development, many adolescents feel that they would like to change something about their bodies. This is one of the major reasons for undergoing cosmetic surgery at a young age. Whatever a person's feelings about cosmetic surgery are, it has been shown that children who have undergone surgery have a more positive body image afterwards (Larson & Gosain, 2012). A sad truth however is that in many cases, these

adolescents do not experience an increase in popularity, an improved ability to make friends or a better romantic life.

One of the most highly performed procedures on younger patients is the removal of the male breast. Cosmetic surgery in this case is not a solution, but rather a quick fix for a larger problem, which is the large amount of obesity among children in the US (Larson & Gosain, 2012).

Another study done in the US, clearly showed that the recession caused a general downturn in the volumes of cosmetic surgery in all age groups, except the 51 to 64-year age group, which showed an increase (Camp, Salcedo, & Gupta, 2011). There are a few likely explanations for this phenomenon, but the more plausible explanation is that women in this age group are on the verge of retirement and they want to appear younger in order to retain a job they desperately need in a difficult economy (Camp et al., 2011).

2.2.7 Generation gaps

It is clear that the reasons for having cosmetic surgery vary for different age groups, and thus the question arises whether various generations view cosmetic surgery differently. The basic principle that has been shown is that more people will be comfortable with the idea of having cosmetic surgery if they know someone who has had a procedure done. This will then hold true for younger generations as they are increasingly exposed to cosmetic surgery. Most research however focuses on younger generations. Voelker and Pentina (2011) from the University of Houston in Texas looked at the reasons why people from Generation Y are interested in cosmetic surgery. The study looked at cosmetic surgery purely as a medical technology available to the public and that the body is seen as a work in progress that can be altered to adhere to social standards or to gain specific individual advantages. The findings of the study showed that the typical Generation Y consumer is very informed and through technology is part of a social network that helps to connect them more easily to the products that they want to purchase. Through this social network, they are regularly confronted with

people who have altered their appearance through cosmetic surgery. In this way they become more interested in cosmetic surgery and are ultimately much more likely to have a procedure done (Voelker & Pentina, 2011).

The idea that a highly technology conscious generation is more inclined to accept cosmetic surgery as a way to alter their appearance to fit into a social norm has been echoed in eastern countries as well. China, for example was the country with the highest recorded number of Internet users in the world by 2009 (McQuaide, 2010). Women under the age of 31 were the fastest growing users of the internet in China during this time, which lead to a new culture where beauty and physical attractiveness became increasingly important. This phenomenon even proved to be true among younger men in China (McQuaide, 2010). This shift of importance from inner values to outer appearance from one generation to the next was driven by the mass media associated with the onset of the Internet. The websites in China, which are focused on women and have the highest numbers of visitors, all advocate the importance of image and physical appearance in order to attain success in both their careers and their marriage (McQuaide, 2010). One of the top Internet sites in China launched a survey in which more than 16 000 women participated. The aim was to get the opinion of the public on female beauty. In this survey they found that 60 percent of the women who participated in the survey were willing to undergo cosmetic surgery in order to enhance their appearance (McQuaide, 2010). In a country like China, where moral values and simplicity in women used to be a big part of their cultural heritage, this statistic shows just how far into the ‘cosmetic era’ the newer generations have gone.

2.2.8 Race

An issue that is very real to SA, due to its unique history, is race. The image that is mostly portrayed by the media around the world of what is considered to be the perfect image has been described by Professor Margaret Hunter of the Mills College in California as ‘white beauty’ (Hunter, 2011). This concept was born out of her research on how the idea of beauty that has been portrayed by the media

and by mostly racist societies in African countries have given rise to a market for skin-lightening treatments in these countries. This is because white faces have long dominated the media's images of beauty and power and these cultures have started to conform to this image in an attempt to be more attractive in worldly terms (Hunter, 2011). This pursuit for white beauty has exposed many affluent African people to the cosmetic surgery market where they are now being exposed to additional methods of attaining the perfect look. The growth in cosmetic procedures for Caucasians in the US from early 2000 has not even reached the 40 percent mark, where the growth in the market for most of the other racial groups have risen to over 200 percent (Hunter, 2011). It is clear that different racial groups might have different reasons for turning toward cosmetic surgery, but they are being exposed in one way or another to this young field of medicine that prescribes to the idea that your body is a work in progress.

2.2.9 State of the economy

In 1999, a study was done at the UCLA Medical Centre to try to establish whether predictions made about the cosmetic surgery market behaved in a manner consistent with general economics (Krieger & Shaw, 2000). Their hope was that a simple economic analysis could show that the market can indeed be predicted. The research proved their hypothesis true, which meant that the market for cosmetic surgery could now be analysed in a way that no other sector of the medical market could (Krieger & Shaw, 2000). This research paved the way for future research to establish not only a better link between the market for cosmetic surgery and the field of economics, but to start predicting the future demand for these procedures.

Later work done in the UK also proved that the demand for cosmetic surgery procedures is influenced by most of the general economic factors affecting the economy and behaves very similarly to the demand for luxury goods (Duncan et al., 2004). Cosmetic surgery can therefore be seen as a luxury item. The demand and supply relationship in the cosmetic surgery market is thus considered to behave in a manner consistent with economic theory that has

existed far longer than elective surgical procedures (Duncan et al., 2004). Like any market that operates within the confines of the general economy however, cosmetic surgery still has to adhere to the fundamental law of supply and demand.

The importance of research in this field lies in the tools it will give a plastic surgeon to establish how to prepare his practice for the ebb and flow of the financial tide. A very large part of the income that a cosmetic surgeon earns, comes from cosmetic surgery – as much as 80 percent (Gordon et al., 2010). If the state of the economy plays a vital role in the demand for cosmetic surgery, then it is important for a surgeon to shift his focus to reconstructive surgery when he knows that the volume for cosmetic surgery is in the process of declining.

A study done in 2009 at the Cleveland Clinic in Ohio also showed the existence of a definite positive correlation between certain economic indicators and a few specific cosmetic surgery procedures. These procedures were breast augmentation, liposuction, forehead lift and facelift. Breast reduction also showed a positive correlation, but is sometimes viewed as a border case between a plastic surgery procedure and a reconstructive procedure (Gordon et al., 2010).

Other studies have commented on the possibility that the trends of productivity in the cosmetic surgery side of a cosmetic surgeon's practice can be used to predict changes to economic indicators. In 2010 the Plastic Surgery Department of the Loma Linda University Medical Centre in California aimed to prove just that by looking at the income of a cosmetic surgery group compared to 18 economic indices (Wong, Davis, Son, Camp, & Gupta, 2010). The study found that quite a few of the economic indices showed a very similar trend than that of the income of the practice. When they focused more closely on the indices with the highest correlation, they found that these indices trailed the trend of the group's income by about a month. This was only true for the self-payment procedures, as the reconstructive income of the practice showed no real correlation, which was expected (Wong et al., 2010). The other side of the coin

would allow surgeons to use their own fluctuations in revenue to predict the general trend in the economy and thus prepare for poor economic times.

2.2.10 Economic indicators

Economic indicators are used to make sense of the state of an economy at a specific point in time, but the most important aspect of economic health is to see continual growth. The recession that countries all over the world have been experiencing over the past few years occurs, for example, when GDP declines for a minimum of two consecutive fiscal quarters (Krieger, 2002). The basic explanation of an economy that is showing a reduction in GDP is thus just that the people are spending less money. It is therefore critical for any industry that operates within a specific economy to keep informed of the changes in these indicators over time. More specifically, if the market for cosmetic surgery behaves like luxury items then changes in certain economic indicators should have an effect on the demand for cosmetic surgery in general.

In a time of recession, the first market where a decline in expenditure can be expected is the market for luxury goods, because people mostly buy these items with their residual income after they have acquired the necessities. Less money in general means less spending on luxuries. This reduction in spending leads directly to a reduction in GDP figures for that financial period. If this trend continues, then companies will eventually have to start cutting jobs in order to remain profitable. The government cannot afford to let the unemployment figure drop too drastically, because part of their mandate is to stimulate job creation. They will thus use fiscal and monetary policy to try to correct the imbalance. The first course of action is usually to lower the prime interest rate, and the banks will thus reduce the interest rate in order to urge people to spend more. The effect of these changes will be that the average citizens will have more money to spend, which could be used to pay for a cosmetic surgery procedure. This logical course of events makes sense when considered objectively, but whether it works like this in the real world, is still a question.

Research has shown that the interest rate in the UK has an inverse relationship with the incidence of certain cosmetic surgery procedures (Duncan et al., 2004). Therefore, as interest rates go down, more cosmetic surgery procedures are being performed due to cheaper access to money. These findings are consistent with the logical course of events. The question remains whether the professionals who provide cosmetic surgery to the public are aware of this and if they will actually use the information for their benefit.

2.2.11 Economic recession

The cosmetic surgery department at the University of California in Los Angeles released an informative article in 2001 that advised fellow cosmetic surgeons not to be disheartened by the recession, but to rather look at it in the same way that the major service industries looks at these challenging times. They advised that surgeons should rather be pro-active than defensive by investing in marketing and infrastructure while money was cheap (Krieger, 2002). This advice may seem counter-intuitive at first, because in times of recession the first instinct is to save rather than spend money. The fact is, however, that the economy is always on a cycle and will correct itself with time. Therefore, if surgeons invested in their future while interest rates were low and while everyone else was holding back, they would reap the rewards when the economy recovered (Krieger, 2002).

During hard times like these, it is easy to worry about what the future might hold. Two doctors from the University of California have tried to ease this burden for cosmetic surgeons by developing a model that would predict the growth of the cosmetic surgery industry into the future using its current growth rate along with other economic variables (Liu & Miller, 2008). Using multiple linear regression models with no less than 40 economic variables and population figures for different age groups, they tried to calculate the possible future volume of cosmetic surgery procedures. Their model predicted a four-fold increase in the total number of procedures per surgeon, and that the total number of cosmetic procedures being performed annually would exceed 55 million by 2015 (Liu & Miller, 2008). These figures include the non-surgical procedures. This prediction

remains to be seen, with the total number of cosmetic procedures at the end of 2010 being almost 14 million (CPSS, 2011). Unfortunately, the swift rise in the number of non-surgical procedures being performed across the US could be a difficult number to predict. This market has shown growth that has surpassed that of cosmetic surgery and should be considered separately (Liu & Miller, 2008).

2.2.12 Income elasticity

Although income has already been discussed, something has to be said about the demand for specific cosmetic surgery procedures when considered separately. An article published in 2010 in the Plastic and Reconstructive Surgery Journal looked specifically at the changes in demand for 15 of the most commonly performed cosmetic surgery procedures to test the income elasticity of its demand (Devgan & Grant, 2010). The principle of income elasticity, when considered in the market for cosmetic surgery, is a relatively simple concept that can be crucial to any cosmetic surgery practice. When the income of people who want cosmetic surgery changes, their demand for specific procedures will also change (Devgan & Grant, 2010). Certain cosmetic procedures, or products if you will, are elastic and thus will only be further demanded as the people's income increases. Other procedures are inelastic, which means that the demand for these procedures will remain relatively constant, even when changes in people's income occur. Inferior products/procedures are purchased less frequently when the consumer's income increases (Devgan & Grant, 2010). Inelastic products are usually viewed by the market as being necessities, while elastic products are luxury items. In the case of the 15 cosmetic procedures analysed in this study, the top results are shown in Table 1.

Table 1: Income elasticity of certain cosmetic procedures

(Devgan & Grant, 2010)

Elastic Procedures/Luxuries	Inelastic	Inferior Procedures

	Procedures/Necessities	
Botox	Breast reduction	Scar revision
Abdominoplasty (tummy tuck)	Chemical skin peel	Rhinoplasty (nose job)
Breast augmentation/enlargement	Laceration repair	Liposuction
Laser hair removal		Blepharoplasty (eyelid surgery)
		Microderm abrasion (skin re-surfacing)

2.3 Conclusion of the literature

The world is changing dramatically and becoming an increasingly global society where information, products and services can be accessed from almost anywhere. In such a world, where the medical professional has increasingly less influence on the choice a patient makes when it comes to elective surgery, it becomes even more important to understand the factors that influence a patient's choice of whether to have surgery. Women remain the primary target of cosmetic surgery marketing, but the increase in the annual incidence of male surgical procedures performed and the rise in younger patients having surgery show that the demographics of this market is changing. Other demographic and social shifts are also occurring, as cosmetic surgery becomes a more and more acceptable means to change one's image, social standing or self-worth. The specific changes might not hold true for every cultural environment, but remains a growing trend in the industry.

The attention that cosmetic surgery is getting in the media, due to the advent of social media and reality television, has increased the exposure of the public to the perceived advantages of cosmetic surgery. This trend, coupled with the reduced cost of surgery in certain parts of the world, is making cosmetic surgery a viable option for more people and thus increasing the demand for it. With the world going through a recession over the past few years the economy has also had a large impact on cosmetic surgery demand, albeit a negative one. If most

cosmetic surgery procedures are seen as a luxury item, then questions start to arise as to how elastic cosmetic surgery is in a poor economy. Many surgical institutions are now looking to economic models to help them better understand the demand for cosmetic surgery.

There is a major absence of research and studies done to try to understand the South African market for cosmetic surgery, which forms the basis of this project. Understanding some of the basic reasons behind the demand for cosmetic surgery in SA could open up a completely new world of possibilities for future research in this field.

3 RESEARCH METHODOLOGY

Research methodology in its simplest form can be explained as the path that a researcher takes when deciding on how to answer his/her research questions (Kumar, 2010). As with all journeys, a start is made with the end in mind, and in this case, it is important to look at the objective of the study. There were two aspects to this study where two specific methodologies were used. The first set of questions revolved around whether certain obvious changes in the characteristics of the sample in this study correlated with similar shifts from the studies discussed so far from various other countries. This was achieved by basic graphical representation and analysis of the sets of data in the sample. These findings corroborated whether this uniquely South-African sample shows the same trends as those seen in international markets. The second aim of the research was to explore how external factors affect the demand for specific cosmetic procedures in this sample. This study made use of a few statistical methods in order to explore the relationships between the different variables. Although the data was gathered over a specific time-period in order to limit the amount of data, the results of this research are not time dependent.

The information gathered from the hospital is quantifiable data with specific values that can be compared and analysed to identify trends and similarities. The question of why the relationship between certain variables exists or does not exist arose and an attempt to answer these questions meant that a small part of this study also fell into the category of exploratory research.

3.1 Research methodology /paradigm

This study made use of quantitative research methods. The main characteristic of quantitative research is its structural depth: it is very specific in its structure and can be tested for validity and reliability (Kumar, 2010). This study specifically investigated the characteristics of certain variables and their changes over time, as well as the relationship between certain sets of variables and the demand for

cosmetic surgery in the specific sample. If definite relationships could be shown between specific variables, then the findings of international research in this regard would be substantiated within this sample and it would pave the way for possible future research.

3.2 Research design

Graphical data analysis, Chi-Square tests and analysis of variance were used to try to show possible relationships between the variables.

Because the demand for cosmetic surgery is best represented by the number of surgeries performed per month, this data set of specific procedures performed over the 24-month period was best expressed in graphical form.

The drawback of graphical analysis was the possibility of graphs being represented on different scales, which may have caused skewed results.

Analysis of variance is a much more effective and scientific way of establishing whether there are significant differences between the mean values of different groups within the data. The results are accurate and universally accepted.

3.3 Population and sample

3.3.1 Population

The population was all the patients in SA who have had cosmetic surgery during the same time-period as the sample. Unfortunately, there is no central database of cosmetic procedures performed in SA like the American Society of Plastic Surgeons. This means that the full scope of the cosmetic surgery market in SA is an unknown entity. All registered plastic surgeons in SA are part of the Association of Plastic and Reconstructive Surgeons of South Africa (APRSSA). This is not a regulatory body and no statistics are gathered on any procedures performed in the country.

3.3.2 Sample and sampling method

The sample for this research was all the people on the database of a specific Johannesburg-based hospital who have had one of the seven most popular surgeries at this hospital performed over a 24-month period. A census was thus taken of the patients who had cosmetic surgery at this facility over a specific time. The time frame for the sample was from January 2010 until December 2011, which equates to 24 months, with 4 302 patients being admitted during this time. All of these people chose to have surgery for cosmetic reasons and were not in need of surgical intervention to solve a health problem. Just over 97 percent of the patients in this sample are female. On examining the sample data, it was clear that the sample had a diverse ethnical spread and was not limited to one group. All of the participants in the study came from a similar socio-economic class, as the surgeries are all paid for by electronic transfer in advance and were deemed expensive by any lower and middle-income class citizen in SA. Although the data for the sample of this study was drawn from one facility, these patients come from various geographical locations across the country. The facility markets extensively online, and by doing so they draw patients from across the country. Annexure B shows the total summary of basic data used, which shows the total number of procedures performed per month, per category.

The main aim of the research was to see whether predictable demand factors emerge in people opting to have cosmetic surgery and how this related to external factors. It was thus imperative to use as much data as possible to increase the accuracy of the results. All the information used for this research was secondary data and was retrieved from the Hospital's Customer Relationship Management software database. No data was personally collected from the patients.

The criteria that was used to sample the data was relatively simple:

A list of the facility's seven most popular surgical procedures was used to limit the sample; they all fall within a similar price range, which is considered expensive. Please refer to Table 2.

Furthermore, a period of 24 months was used to limit the sample. These procedures were all paid for in once-off cash transactions as the hospital only admits patients who have paid for their procedures in advance via EFT, and therefore excludes all people with limited financial resources. Currently only two financial institutions in SA provide finance for cosmetic procedures, and their credit terms are quite strict.

Table 2: Procedures to be considered for this study

Procedure
Facelift
Rhinoplasty – Nose job
Breast augmentation – Enlargement
Breast ptosis correction – Breast uplift
Breast reduction
Liposuction
Abdominolipectomy – Tummy tuck

3.4 The research instrument

Analysis of Variance and correlation matrixes was used to try to establish a correlation between the variables, to see which of these had the highest correlation to the demand for cosmetic surgery.

Graphical analysis of the basic patient information was done to see whether specific trends are emerging and how the profile of the patients changed over the 24-month period. To confirm whether certain associations between nominal variables are significant, a Chi-Square test was used in various situations as necessary. This was ideal and made very clear to any observer, which trends emerge from the sample.

3.5 Procedure for data collection

The data was extracted from the database of the customer management software of a surgical facility in SA specializing in cosmetic surgical procedures. The hospital agreed to the use of the data as long as no personal identifying information of any of the patients was used. The data was checked for duplicates to ensure the accuracy of the results.

3.6 Data analysis and interpretation

The first section of the data analysis is a basic graphical analysis with the use of graphs to assist in the easy presentation of the information. To plot the number of surgeries performed per month for both male and female patients over a 24-month period, for example, would clearly show whether there is a rising trend in male patients opting to do cosmetic surgery. Chi-square tests were used to test the association between certain nominal/ordinal variables that seem to have a significant relationship. In order to compensate for the large sample size, Cramer's V measure was used to indicate the strength of the association between variables.

Analysis of Variance was used for the comparison of the demographic and economic variables. Analysis of Variance (ANOVA) uses basic tests to try to recognize whether significant differences appear between different data sets and their mean (Chen, 1988). The reason for using this technique was that the study is only interested in the change in one variable when compared with the change in another selected variable at the same point in time.

The problem with variance analysis was that it does not compare data over time, but simply compares one variable with another or one variable with multiple sets of other variables. The fact that they were arranged according to date could not be taken into account in this model. An advantage was that the variables could be arranged from highest to lowest. In this way, it was possible to test the effect

of one variable on another at the specific point of change to see how they affect each other, irrespective of the specific point in time.

This technique was used to analyse the various sets of data with one another in different ways to see whether a correlation could be found. To do this, multivariate correlation matrixes were used, as well as linear regression models.

Some information in the data set, which would have added a lot of value to the study, was not available. Personal wealth (economic status) of the patient was not available, and therefore a proxy was used to substitute this variable. Personal wealth can be indicated by variables such as gross income or total net worth. This information was unfortunately not possible to attain as the hospital does not require information such as this from their patients and the hospital management refused all requests to contact the patients directly for this study. The average house price per suburb was then used as a substitute for personal wealth. This was the only variable available for this study that could provide some information about a customer's economic status. A person's physical address shows in what area they can afford to live and thus provides a good idea of that person's wealth.

The interpretation of any results gained from a study must always be viewed in context, and for this study the context is the cosmetic surgery market in the Gauteng area. It is thus important to note that the interpretation of the various results is made within this cultural framework.

3.7 Limitations of the study

The data was collected from a single hospital where the patients were operated on, but, as there are numerous surgeons who operate at the facility, the sample covered a number of these surgeons, whose rooms are not at the same location. The demand for surgery can be influenced by a surgeon’s ability to create rapport with his or her patient and to sell the procedure to them during consultation. Patients tend to be very specific about their choice of surgeon

based on perceived skill and experience (Voelker & Pentina, 2011). These doctors also have various marketing drives that they employ to gain additional patients. The individual variances in the ability of the doctor to retain his patients and gain new referrals cannot be accounted for in this research.

As mentioned, it will be difficult to view the findings of this research as applicable to the total South African market, as the cultural differences between Gauteng and Cape Town for example can be very dramatic when looking at the aesthetic market. The findings will however hold true for the greater Johannesburg and Pretoria area, as this is where the patients come from.

The data has been gathered from a hospital in Johannesburg during a time of recession, and therefore the effect of changes in economic indicators on the demand for cosmetic surgery will possibly be less dramatic during better economic times when people have more money to spend.

3.8 Validity and reliability

Probably one of the most important aspects of any research is to know that the results attained mean something to someone in the real world. Validity of a study refers to the credibility of the research and is concerned with how accurate the result is. If researchers cannot positively answer whether they have faith in the findings, then the research is essentially of no value (George, Batterham, & Sullivan, 2000).

3.8.1 External validity

The concept of external validity refers to whether the findings of a study on a specific sample can be applied to the population, or whether the study will still be accurate if performed in a different setting (George et al., 2000). If the external validity of a study can be assured, then the results of that study can be applied to the general population.

For this study, the results would be consistent with any other research done within the greater Gauteng Province. The Gauteng Province is well represented by the database used in this study, this is the area where all of their patients come from, and where the facility's marketing efforts are directed. The facility does not get many patients from Cape Town and its surrounding suburbs, but they also do not market in those areas. The results of this study cannot be generalized for the whole of SA, as demographic variations in population from one province to another in SA exist.

Because the entire database was used, there was no sampling bias. If the study was to be repeated for a different time frame, then the only factors that could alter the results of the study will be external factors. The reason for this is that these factors will differ, when analysed a few years from now, from the period under review.

3.8.2 Internal validity

Internal validity is attained when the results of a study or research project can accurately describe or measure the outcome that was initially intended. Simply put, does the data in the findings accurately describe/answer the research question (George et al., 2000).

In order to ensure the internal validity of this study, the data was not limited to a single variable, but rather various data sets were used. This study also looked at seven different types of cosmetic surgical procedures, and compared the results of the various procedures. The accuracy of the findings was supported as it holds true for multiple types of surgery. The volumes of the various procedures were measured against each external variable in turn to try to ensure that inferences cannot be drawn from a single finding.

For this study, a census was taken of all patients on the database whom had one of the seven cosmetic surgery procedures used for this study. Thus, the sample is quite large and increases the internal validity of the results. A duplicate check was used to ensure that the same patient is not captured twice, unless that

person had two separate cosmetic procedures. A two-year cycle of cosmetic surgery volumes was used for this study to try to see whether any seasonal trends emerge. This also ensured that the study did not draw conclusions based on one year's data, when it is always possible that certain external factors influenced the data in one specific year. In a recession, for example, banks will always act quickly to try to counteract the effects of the recession and this could skew economic data for that particular year.

Certain measures, like Cramer's V measure, were taken to ensure that the strength of any significant findings is tested. This confirms the findings due to the large population used.

It is also important to remember that if the internal validity is managed too strictly and all factors are being restricted in one form or another, then it might take away from the external validity of the study. The question that must be asked is how close the study's parameters come to the real world situation for which the results will be translated (George et al., 2000).

3.8.3 Reliability

Reliability can refer to both the results of the research as well as the research instrument used. If anyone using a similar methodology with the same data can get the same results with a given study, then the research instrument is deemed to be reliable. If the findings of a research sample is a proper representation of the total population from which it came, and if these findings remain similar over time, then the results of a study is reliable (Golafshani, 2003). The main principle is that it must be possible to replicate the study, if necessary, and get the same or similar results.

In this study, the methodology used to gain the results was relatively simple and very easy to replicate with most statistical software. Due to the simplicity of the methodology, the study can be seen as highly reliable. It was previously discussed that the factors affecting the results of the study at a different point in

time has to do with the volatility of the industry and not with the way in which the results were obtained.

4 PRESENTATION OF RESULTS

4.1 Introduction

The data is first represented graphically, which provides a general indication of the characteristics of the data and clearly shows how it has changed over time. One of the benefits of this is that the data can be viewed in various combinations, which makes it very easy to recognise important changes in the data. If specific trends or noticeable differences emerge, then it could allude to the changing dynamics of the industry and present a cause for further investigation.

4.2 Demographic profile of the sample

There are 4 302 surgical procedures in the sample. Of these, 2.4 percent were done on male patients. The total sample was also classified according to race. Figure 1 shows the racial distribution of the patients in this sample.

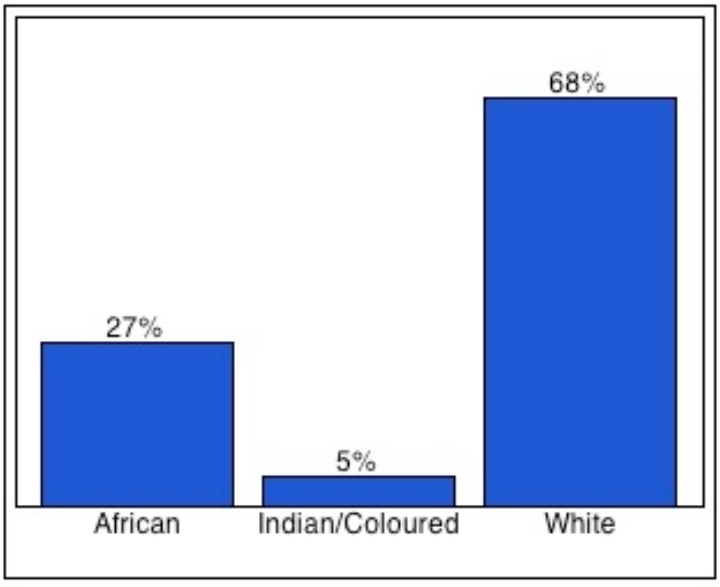

Figure 1: Percentage distribution of racial groups within the sample

4.3 Results

4.3.1 Fluctuations in total procedures performed

The total number of cosmetic surgery procedures performed per month over the 24-month period is shown in Figure 2. Apart from January 2010, the data shows a similar pattern of change in demand over the total period. The highest number of procedures performed in one month during the 24-month period was 351, which was recorded in October 2010. The lowest number of procedures performed in one month was 56 in December 2010. It is not clear whether the fluctuations in demand over the period have any seasonal influences, looking purely at the data.

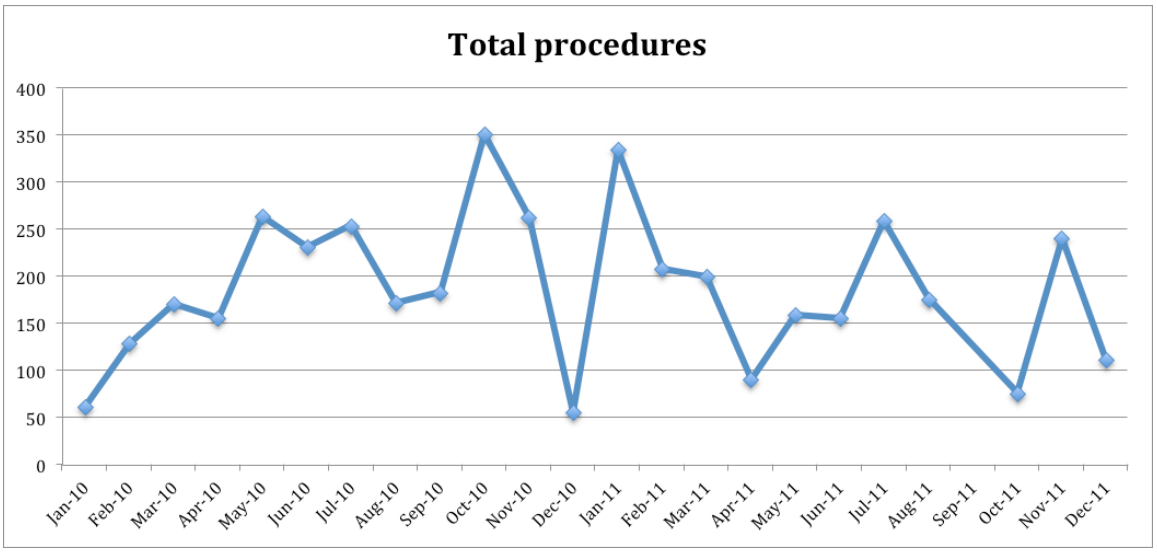

Figure 2: Distribution of total number of procedures performed

4.3.2 Popularity of specific procedures

It is important to look at the breakdown of the specific procedures performed as a percentage of the total. As this is a uniquely South African sample, it is interesting to note which procedures are the most popular. Figure 3 shows the numbers of each procedure performed over the two years as a percentage of the total of all procedures.

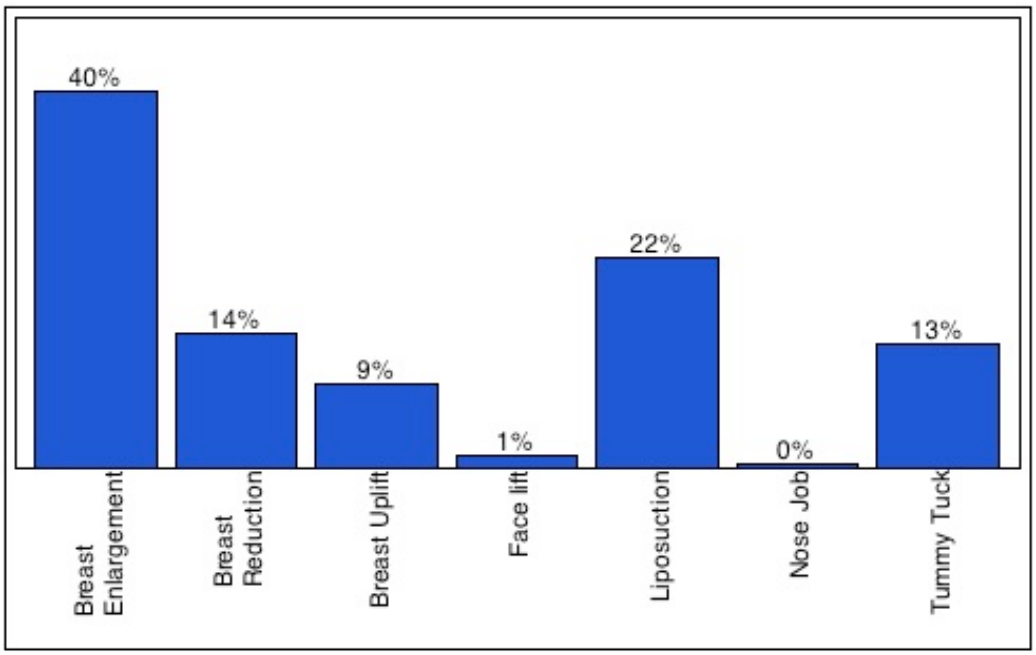

Figure 3: Popularity of procedures performed

4.3.3 Differences in procedures performed for racial groups

The literature has shown that some differences exist when comparing the most popular cosmetic procedures for various racial groups. In Table 3, the breakdown of the various procedures performed per racial group is shown and expressed as a percentage of the total procedures performed during the 24-month period. Figure 5 shows the preferences within the three racial groups for the procedures most performed. It is interesting to see that each group has a different list of priorities when looking at procedures. In the African group, liposuction and breast reduction are the most highly performed procedures. For the Indian/coloured group it is liposuction, and for the white group it is breast enlargement by a large margin. These findings clearly point toward cultural differences of what is seen as important for each group in order to attain a certain image of what is considered attractive in their cultural environment.

Table 3: List of specific procedures performed per racial group in 2010 and 2011 - Showing percentages per race group per year and per procedure

	Race					
	African		Indian/Coloured		White	
	Year		Year		Year	
Procedure Name	**2010**	**2011**	**2010**	**2011**	**2010**	**2011**
Breast Enlargement	18%	18%	18%	24%	49%	52%
Breast Reduction	24%	28%	18%	18%	10%	9%
Breast Uplift	10%	7%	4%	2%	10%	9%
Face lift	1%	1%	1%	6%	1%	1%
Liposuction	30%	28%	41%	25%	21%	16%
Nose Job	0%	0%	0%	0%	0%	0%
Tummy Tuck	16%	18%	18%	25%	9%	13%
Total Per Race per Year	100%	100%	100%	100%	100%	100%

	Race						
	African		Indian/Coloured		White		Total per Procedure
	Year		Year		Year		
Procedure Name	**2010**	**2011**	**2010**	**2011**	**2010**	**2011**	
Breast Enlargement	7%	5%	1%	1%	44%	42%	100%
Breast Reduction	25%	25%	3%	3%	24%	20%	100%
Breast Uplift	17%	9%	1%	1%	40%	33%	100%
Face lift	16%	9%	2%	11%	30%	32%	100%
Liposuction	20%	16%	5%	2%	34%	23%	100%
Nose Job	0%	29%	0%	0%	0%	71%	100%
Tummy Tuck	18%	17%	4%	4%	25%	32%	100%

Graphical analysis has now shown some specific differences in the procedures most preferred by each racial group, but the question remains, whether these differences are statistically significant. The Chi-square test was also performed to see whether dependence exists between specific cosmetic procedures and racial groups. The Chi-square test results are shown below in Figure 4.

Tests

N	DF	-LogLike	RSquare (U)
4302	12	267.54693	0.0820

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	535.094	<.0001*
Pearson	519.303	<.0001*

Figure 4: Chi-square results for racial groups and specific cosmetic procedures

The full contingency table and Chi-Square test is attached at Appendix A.

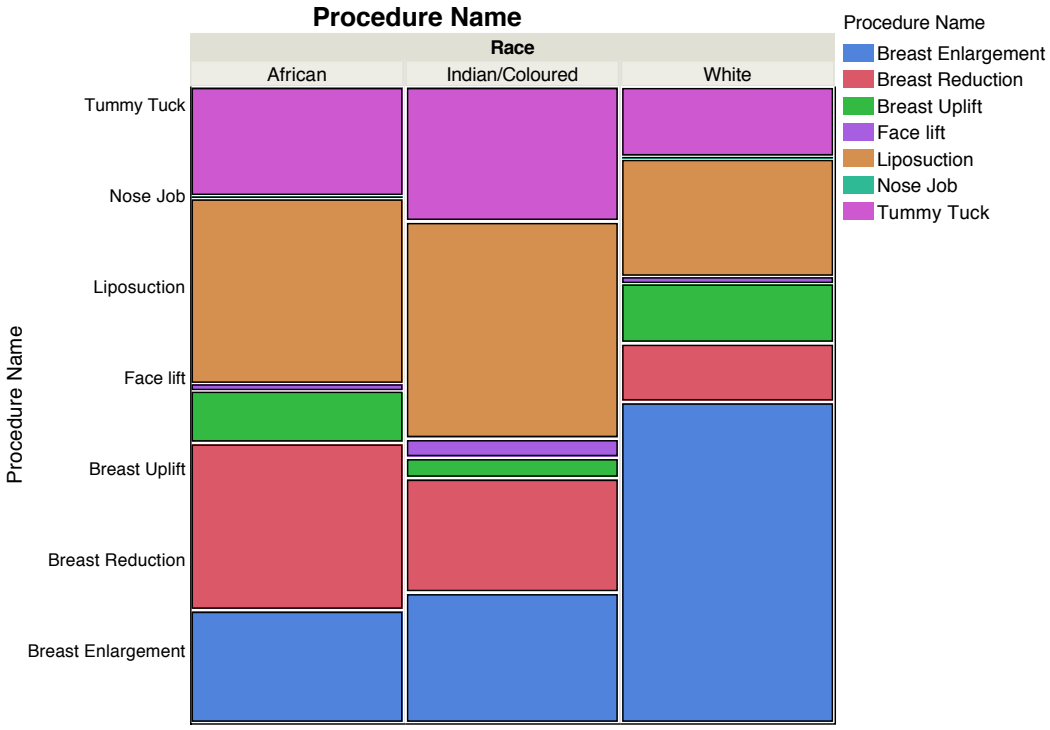

Figure 5: Preference in cosmetic surgery per racial group

When a significant association was found between these sets of variables then the Cramer's V measure was used to test the strength of this relationship. The reason for this added measure is that large sample sizes might often show a relationship between two variables although the relationship is not practically useful. From the Chi-Square test performed it can be seen that at a 95 percent level of confidence a strong relationship exists, as the p-value is smaller than 0.05. Cramer's V measure was used to test whether this relationship is significant. The Cramer's V value of 0.25 shows that the association between these variables is weak to moderate. The choice of surgery is thus significantly linked to a person's racial group, showing that specific racial groups gravitate towards certain procedures, but will not predict the exact choice of surgical procedure.

It is clear that each race has a separate set of factors that dictate which procedure they prefer. These factors could range across the board of factors

discussed in the literature review, from an ideology of what is perceived as beautiful within each cultural subset to very specific personal reasons, like celebrity worship and low self-esteem.

When looking at the aggregate of demand for cosmetic procedures in total, a different picture emerges. A proportional distribution was done for the total procedures performed per month by race, which can be seen in Figure 6. There is one disproportionate spike in demand for total cosmetic procedures in the Indian/coloured patients in this sample, but otherwise the fluctuations in demand follow a very similar pattern for the different racial groups over the 24-month time period.

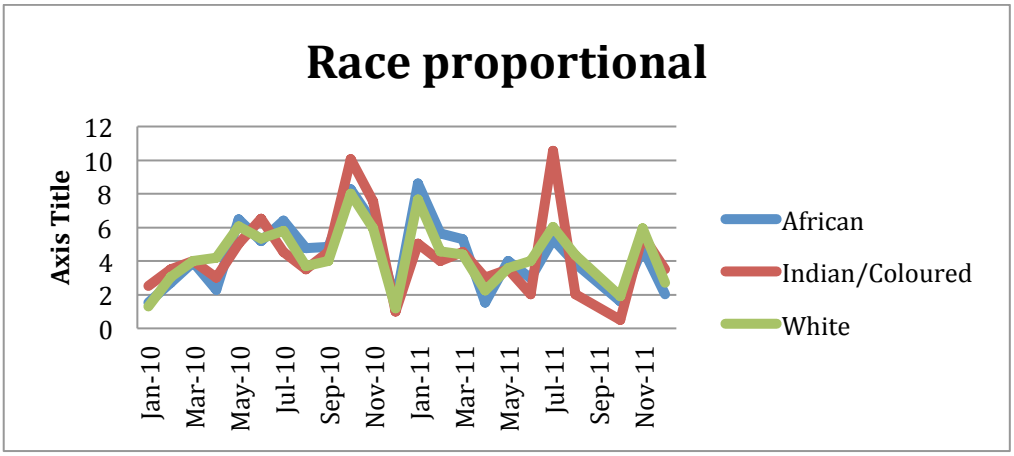

Figure 6: Proportional distribution of procedures performed per race

The final factor that needed to be considered regarding the differences between the three racial groups was whether the fluctuations in the demand for cosmetic procedures changed significantly from one year to the next. The literature review showed that the demand for cosmetic procedures in all other racial groups apart from white patients showed significant increases, where the demand for cosmetic procedures in white patients remained the same or even decreased.

A Chi-Square test was done to test the relationship between the changes in demand from year to year per racial group. The full result of this test is shown in Appendix A. It is clear that no statistically significant relationship exists between these two sets of variables. Basic observation of the data in Table 3 shows that

the demand for the various cosmetic procedures for all racial groups went down in 2011, when compared with 2010. The magnitude of the difference in the demand, however, is much lower for the white group than for the other two groups.

4.3.4 Differences in procedures performed per gender

When looking at the total demand for cosmetic procedures performed on women versus men, then it is clear that there is very little demand for male cosmetic surgery at this hospital. The size of the male sample is very small, which makes statistical analysis of the sample difficult. A bigger sample in general provides more reliable results, but in this case analysis was done on the available data.

Even though the total number of procedures was lower than expected, the demand for male cosmetic surgery at this facility is constant and goes through fluctuating patterns. When you consider the male and female procedures performed, as a percentage of the total procedures performed then it is much easier to compare these data sets. Figure 7 thus shows the proportional distribution of the total number of procedures for male and female patients, and that the demand for cosmetic surgery for both men and women go through a similar pattern of change over the two years. This is an indication that whatever factors are influencing the change in demand over the 24-month period for cosmetic surgery in women also affects the demand for cosmetic surgery in men.

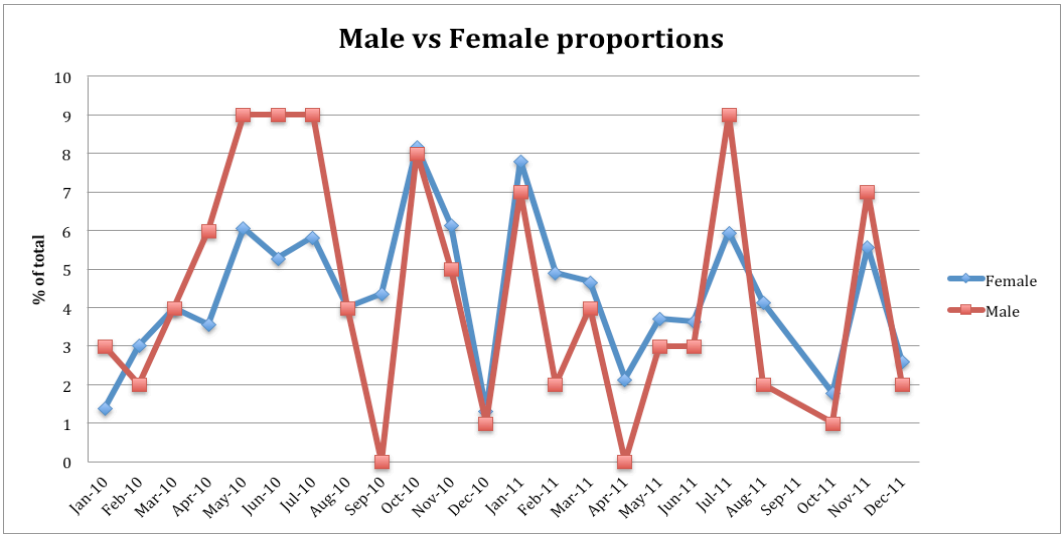

Figure 7: Proportional distribution of male versus female procedures

It is an obvious fact that the procedures performed on male patients in this case are less than that of women and therefore the demand for specific procedures would be very different. When looking at the various procedures and the incidence of these procedures performed on men and women in the sample, then preferences for specific procedures start to emerge as indicated clearly by Figure 8.

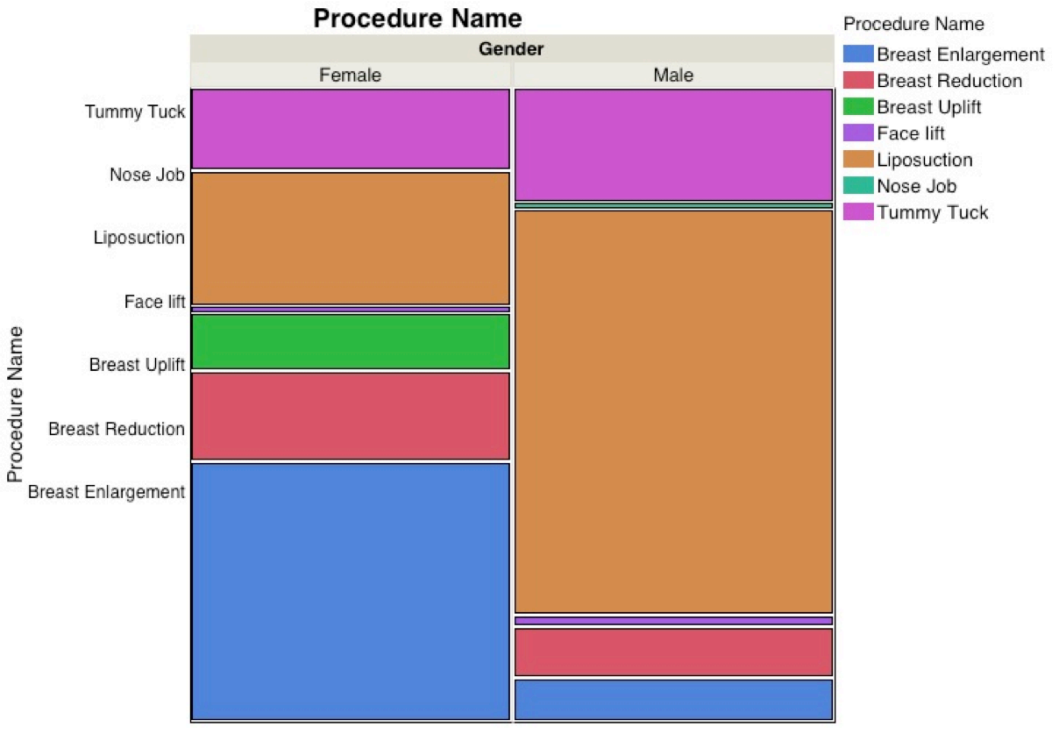

Figure 8: Preference in cosmetic surgery procedures per gender

The male patients have a much higher incidence of liposuction procedures than any other procedure, with tummy tuck procedures in a distant second place. The most highly performed procedure for the total female sample is breast enlargement, then liposuction and breast reduction. With both the male and female samples having single procedures standing out clearly as the top performed procedures, a Chi-Square test was performed to test the relationship between gender and preference for specific procedures. The full set of results for this test is in Appendix A. The test proved that the relationship between these variables is indeed statistically significant (Chi square = 126.833, df = 6, p<.0001). The Cramer's V measure, however, shows that this association is weak.

For both the male and female sample groups the total number of procedures performed in 2010 was higher than the total figures for 2011. A summary of these results is depicted in Figure 9.

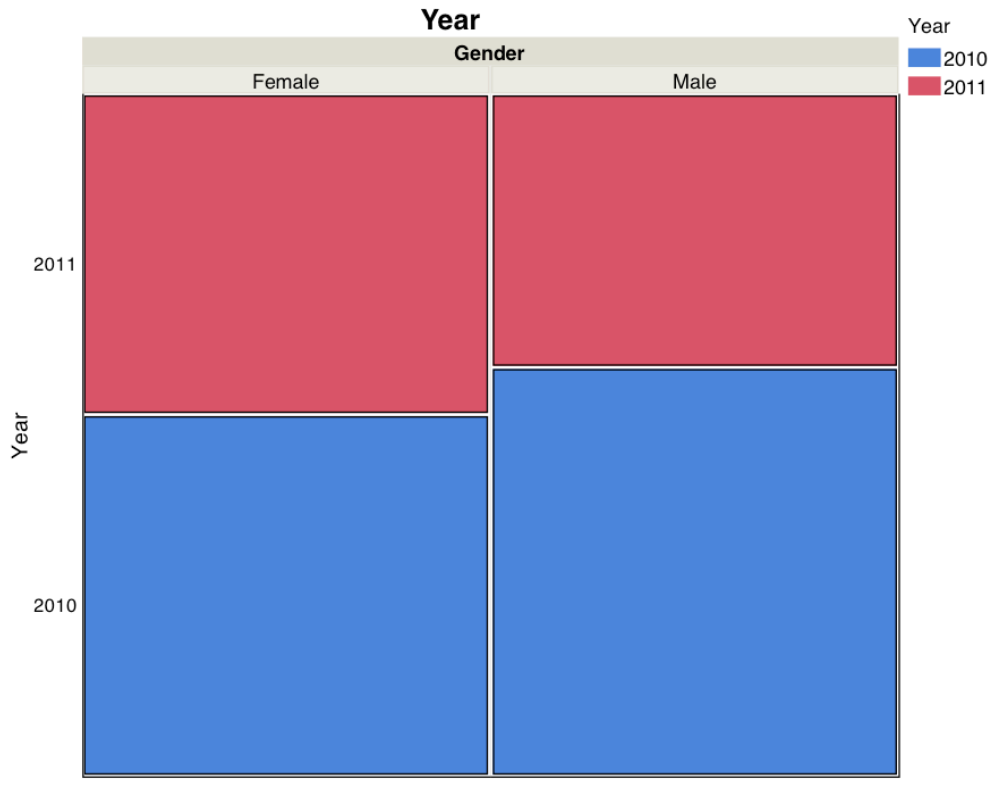

Figure 9: Total procedures per gender per year

The total number of procedures performed on male patients went down from 60 to 40, and the total number of procedures performed on female patients went down from 2 231 to 1 971. For the male sample, this represents a 33 percent decrease in demand for surgery between 2010 and 2011, but for the female sample, the decrease is only 12 percent. To test whether the relationship between the total demand for surgery, per year, per gender is significant, a Chi-Square test was performed, but no statistically significant relationship could be found (Chi square = 1.871, df = 1, p = 0.1713). The full breakdown of the Chi-Square test can be seen at Appendix A.

4.3.5 Link between general economic data and procedures performed

As shown in the literature review, some interesting correlations between variances in specific economic data and the demand for surgical cosmetic procedures have been found in certain countries. This possibility was explored in this research by drawing up a correlation matrix between the total number of procedures performed and various economic indicators. The economic data used was the Consumer Price Index (CPI), Gross Domestic Product (GDP), Interest Rate (IR), Unemployment, JSE/FTSE All Share Index (ALSI), Capped Index (CAPI) and the Shareholder Weighted Index (SWIX). All three indices that were used were further broken down into the Index Value (Value), the Total Return Index (TRI), the Dividend Yield (DY) and the Earnings Yield (EY). The only strong correlation that emerged was the correlation between monthly CPI figures and the total number of procedures performed per month. The results of the correlation matrix are shown in Table 4.

Table 4: Correlation matrix of total cosmetic procedures and specific economic indicators

Multivariate correlations	Total
Total	1.000
CPI	-0.42
GDP	0.208
Interest Rate	-0.05
Unemployment	-0.15
J203 – Alsi Value	-0.07
J203 – Alsi TRI	-0.08
J203 – Alsi DY	-0.16
J203 – Alsi EY	-0.19
J303 – Capi Value	-0.07
J303 – Capi TRI	-0.08
J303 – Capi DY	-0.17
J303 – Capi EY	-0.18
J403 – Swix Value	-0.08
J403 – Swix TRI	-0.08
J403 – Swix DY	-0.18
J403 – Swix EY	-0.12

From the table it is clear that the strongest correlation coefficient value is for total procedures performed and CPI, with a value of 0.42. Any correlation coefficient close to 1.00 indicates a strong relationship, as 1.00 is a 100% correlation. The correlation can be either positive or negative, but any correlation below 0.3 is not strong enough to be considered for the purposes of this study.

Figure 10 demonstrates the negative relationship between these two variables although the relationship is not a very strong one, as can be seen from the various outlying data points.

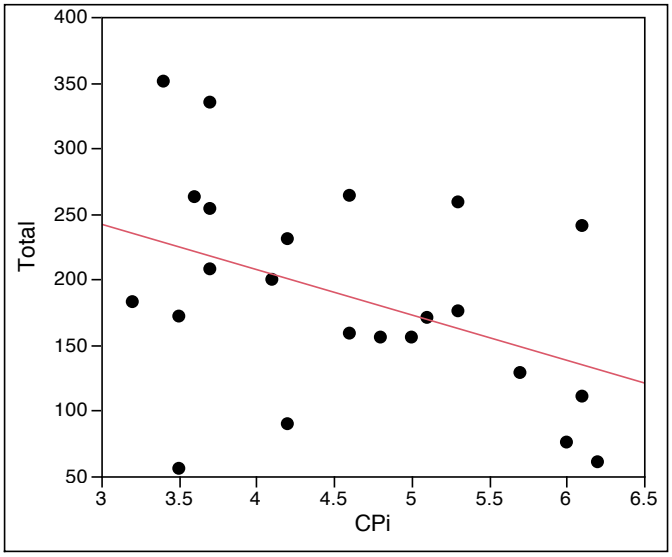

Figure 10: Relationship between CPI and total cosmetic procedures performed

The matrix has shown that specific variables have a definite relationship with others in the data set, but it does not prove that the relationship is statistically significant. A Pearson correlation analysis was done to test the significance of this relationship as can be seen in Table 5.

Table 5: Correlation analysis of CPI and total procedures done

Pairwise Correlations						
Variable	**By Variable**	**Correlation**	**Count**	**Lower 9.5%**	**Upper 9.5%**	**Significant Probability**
CPI	Total	-0.4236	23	-0.7115	-0.0138	0.0440
GDP	Total	0.2080	23	-0.2233	0.5712	0.3409

The results revealed a moderate negative relationship ($r = -0.42$, $N = 23$, $p = 0.044$). Although Figure 10 shows many outliers, the principle finding is that a negative relationship has been shown, which is what was expected. Higher levels of CPI were thus associated with lower numbers of total procedures done per month. People spend less when the price of goods increases.

As an added measure, an F-test was done to determine the significance of this linear relationship and the resultant p-value of 0.044 showed a significant relationship at a 95 percent level of confidence.

4.3.6 Economic status and choice of surgery

Proving a relationship between economic indicators such as CPI and the demand for cosmetic surgery just validates the concept that cosmetic surgery also behaves like a normal luxury item in South Africa too. In order to gain more insight into the profile of the average cosmetic surgery shopper in Gauteng, this study also looked at the economic status of cosmetic surgery customers.

The literature review indicated that personal wealth is a much better indicator of the demand for cosmetic surgery than the level of income of patients. Personal wealth is however, a difficult variable to measure, as this information is not readily available and certainly not present in a hospital database. For this reason, a proxy was used for economic status based on the information available. The residential areas of all the patients were categorized according to the average house price in that area, from low to very high. People living in suburbs with higher average house prices are considered wealthier than those in areas with lower house prices. See Table 6 for the classification used for the house prices.

Table 6: Classification used for average house prices

Rating – Ave House Price	
Very high	> R2 000 000
High	R1 000 000 – R2 000 000
Medium	R600 000 – R1 000 000
Low	Below R600 000

Not all the customers on the hospital database provided valid residential areas, as many patients prefer to give only postal address information. All patients living

outside the Gauteng province were excluded, so that the sample included only Gauteng residents. The total number of patients within this sample with valid residential addresses was 1238. The economic status of each patient, according to the classification in Table 6, was measured against the various procedures performed to see if a correlation existed. See the contingency table in Appendix A. This clearly shows that the highest proportion of surgeries performed is comprised patients that come from suburbs that are more affluent. The number of surgeries that were performed on patients that came from the suburbs with high and very high house prices was 46.37 percent and 39.5 percent respectively, totalling 85.87 percent. This means that only 14.13 percent of all the surgeries performed were done on patients coming from areas low and medium priced houses. A Chi-Square test was done, which showed that the relationship between these variables is statistically significant at a 99 percent level of confidence (Chi-square = 59.054, df = 18, p<.0001).

The results show that various factors influence the demand for cosmetic surgery in different ways in this uniquely South African sample.

4.4 Summary of the results

There are clear similarities in the fluctuation of demand from one year to the next, which indicate potential effects of seasonality of the data. Each racial group showed a different ranking for the popularity of the various procedures, with certain procedures standing out clearly as favourites. The choices of most popular cosmetic surgical procedure also differ considerably when male and female patients are considered separately. The demand for male cosmetic procedures is also a lot lower than expected and form a very small percentage of total procedures performed. These internal characteristics of the sample show specific influences on the choice and volume of surgical procedures performed. There are, however, certain external economic factors that also appear to have a significant impact on the demand for surgical cosmetic procedures. Of all the variables considered, the results showed that CPI had by far the most significant impact on the demand for cosmetic surgery. Increase in CPI had a negative

effect on the demand for cosmetic surgery. Lastly it was shown that a significant correlation exists between economic status and demand for cosmetic surgery. Patients living in suburbs that are more affluent utilised the services of cosmetic surgeons more than patients in poorer suburbs did.

5 DISCUSSION OF THE RESULTS

This chapter starts with a brief overview of the demographic characteristics of the population used for this research and then looks at possible personal and cultural influences on the demand for cosmetic surgery, within this population. Furthermore, this research highlights the external economic influences that affect the demand for cosmetic surgery as well as those that do not. Lastly, an attempt is made to try to explain the specific relationships between these external factors and the demand for cosmetic surgery.

5.1 Demographic profile of respondents

A census of all the patients who had cosmetic surgery at a specific hospital in Johannesburg was taken over a two-year period, from January 2010 to December 2011. For the purposes of this research, the number of procedures performed was used and not the number of people in the database during this time, as some patients had more than one procedure in this period. After cleaning up the data, there were 4 302 surgical procedures performed, which made up the population data. Of these procedures, 2.4 percent were done on male patients, which accounted for a mere 100 procedures. This result was much lower than expected, as worldwide figures for cosmetic surgery performed on male patients are higher. In the US, the percentage of male cosmetic surgery patients stays at about 10 percent of the total procedures performed, with the only sign of decline being due to the recession (CPSS, 2011; Davis, 2002).

The total sample was also classified according to race, as shown in Figure 1. It was clear from the graphical representation of the results that the white patient group was by far the largest group in the population, with 2930 procedures performed on white patients. The number of procedures performed on the African patient group was 1 173, and only 199 on the Indian/coloured patient group.

To try to establish what the economic status of the patients is, a proxy was used for personal wealth. All the available physical addresses of the patients in the population were classified into four categories, based on the average house price of each suburb. The data showed that more than 80 percent of the population came from the more affluent areas. Unfortunately the ranges of average income of the population were not available, which could have provided a good comparison to see whether level of income or economic status was a better indicator of cosmetic surgery demand.

5.2 Discussion of results

5.2.1 Fluctuations in total procedures performed

Figure 2 showed the graphical representation of procedures performed per month for the 24-month period. It is not easy to identify or prove a seasonal trend in the data, but certain similarities between the two years did stand out. The procedure totals seemed to go through a changing demand pattern, but always returned to higher levels of surgeries performed toward the end of the year, with a big drop during December. After discussing this trend with the hospital manager, two things became clear in this regard: first, the demand for surgery is always higher toward the end of the year as this is the time leading up to the summer holidays in SA.

As shown in Figure 3, breast enlargement is by far the most commonly performed procedure and it is during these three months that women tend to want to have this procedure done. These women want to have the bruising gone by the time they go to the beach for their holiday, which is one of the major reasons given by the hospital managers for the spike in demand for this procedure, and consequently other procedures as well, during these times. Second, the lower demand during December every year is a result of the fact that all the surgeons who operate at the hospital take time off during December and close their practices from the mid-December for the Christmas holidays.

Most of these surgeons only open up for business again in the second week of January, which also accounts for the increase in demand in January as many of the patients who could not be accommodated in December get their procedure done in January.

The biggest possible factor that has an influence on the data that might cause unnatural shifts in demand is the marketing practises of the hospital. The Health Professions Council of South Africa (HPCSA) does not allow surgeons to market their services directly as this is seen as canvassing and touting and could lead to one doctor looking superior to another in the eye of the public. For this reason, the hospital is marketing the services offered by the various surgeons. This is done mostly with the use of online media and search engine optimization. These platforms are used to inform the public of their services and to communicate information about specific procedures to patients. These marketing efforts in turn generate additional enquiries for the hospital and its doctors.

Smaller variances on volume of procedures can occur when certain doctors who usually perform a number of surgeries go away on holiday or to professional congresses. The data cannot account for these shifts in demand, but the effect of these minor decreases in demand is negligible.

5.2.2 Popularity of specific procedures

The list of most preferred cosmetic procedures when looking at the total figures is shown in Table 7:

Table 7: Preferred cosmetic procedures

	Procedure	Percent procedures	Number of procedures
1	Breast enlargement	40%	1 731
2	Liposuction	22%	961
3	Breast reduction	14%	613

	Procedure	Percent procedures	Number of procedures
4	Tummy tuck	13%	563
5	Breast uplift	9%	383
6	Face lift	1%	44
7	Nose job	1%	7

This list showed some interesting differences when compared to the top procedures in the US, which is breast enlargement, nose job, liposuction, eye-lid surgery and face lift in that specific order. Apart from breast enlargement, there are big differences in the preference of procedures across the regions. This is one of the aspects that relates to culture more than any other aspect of demand, as certain cultures have different ideas of what is perceived as beautiful. It thus seems that larger and fuller breasts is the only physical attribute that is seen as attractive across the board, which leads to breast enlargement procedures claiming the top spot globally.

It is interesting to note that facial procedures such as a nose job and eyelid surgery is very popular in the US, but was very unpopular in the SA hospital that provided the sample for research. One of the main reasons for this is the influence that the media has in country like the US and England where celebrity worship is a common occurrence among young people (Maltby & Day, 2011). The celebrities in these countries are adored in a way that is not common in SA. The pressure on these celebrities to remain attractive leads to them having a lot of facial and general cosmetic surgery. Therefore, the images that are being portrayed by the media are faces that have undergone cosmetic surgery. It is logical that countries like these have a higher rate of facial cosmetic procedures, when the idols they follow are regularly having these procedures done. This is because any positive exposure to cosmetic surgery over time makes people more likely to accept cosmetic surgery in the forms that they are exposed to (Swami et al., 2008).

5.2.3 Differences in procedures performed for racial groups

South Africa is one of the most culturally diverse countries in the world and boasts a large variety of cultures and languages. Just as diverse as the history of these cultures is, so different are their perspectives of what is attractive. While the picture of a white female in a bikini-ready body with tanned skin is attractive in the white culture, certain black cultures in SA do not find a trim figure attractive. The Zulu culture, for example, feels that a slightly overweight female body is much more attractive as it is a sign of health and virility. For reasons like these, the concept of beauty for each culture would be drastically different and this would naturally flow over into their choice of cosmetic procedure. It was expected that a significant difference in the preference of cosmetic procedure would be apparent and this is exactly what the results of the graphical analysis and Chi-Square test revealed.

The breakdown of the top three procedures per race group is shown below.

Rank	White	African	Indian/Coloured
1	Breast Enlargement	Liposuction	Liposuction
2	Liposuction	Breast Reduction	Tummy Tuck
3	Tummy Tuck	Breast Enlargement	Breast Enlargement

Table 8: Top three cosmetic procedures per race group

Table 8 shows that the order of preference, and thus demand, for these procedures differs per group. The Chi-Square test revealed a significant relationship between choice of surgery and racial group (Chi square = 519.303, df = 12, p<.0001). The Cramer's V measure indicates a moderate relationship. This means that in at least half of the total customer-base going forward, a prediction can be made of the potential top three choices of surgery if the patient's race was known. This finding has very positive marketing implications for the future. Specific marketing drives can be launched to market chosen procedures to a chosen group of people in order to accomplish a much more

focused marketing strategy. This will dramatically reduce marketing costs while attaining a better result.

Figure 6 shows the total fluctuations in demand for the three race groups over the period. This graph shows a consistency in the pattern of changing demand within the three groups. This means that, whatever the differences are within the three groups, they all show very similar demand shifts. It is therefore not possible to attribute the total demand for cosmetic procedures on cultural or other internal characteristics. It shows that each group is being affected in very much the same way by external factors that affect their decision whether to have cosmetic surgery.

Historically, cosmetic surgery was a white dominated industry from a customer point of view. This has however begun to change in countries like the US where the growth in the number of procedures performed on other racial groups increased more than the number of procedures performed on white patients (Hunter, 2011). Access to more money has also been quoted as one of the top reasons for the growth in demand for cosmetic surgery (Henderson-King & Henderson-King, 2005). The majority of the SA population belongs to previously disadvantaged groups, who are now turning into a wealthy middle class with more money to spend (Olivier, 2007). This information has created the expectation that the growing black middle class would be a fast developing segment of the market for cosmetic surgery, which based on the results of this study turned out not to be the case at all. All three racial groups within the population showed an overall decrease in demand from one year to the next, with no single group standing out above the rest in terms of changing demand. The white patient group is by far still the biggest patient base for cosmetic surgery in this sample, but none of the other groups is showing any indication of catching up. Admittedly, this data was taken during a time of recession for the country, which could mean that a very different picture might emerge in a healthier economic climate. However, this is not possible to test at present.

5.2.4 Differences in procedures performed per gender

The literature shows that most research done on the rising awareness of male cosmetic surgery, all of them share a similar message: although male cosmetic surgery is slowly rising, as more men are becoming aware of its benefits, it will always remain an industry dominated by the female patient. (Davis, 2002; Elsner, 2012) From the global figures of the male segment of the cosmetic surgery market, it was expected that close to 10 percent of this population data would be male patients and that the demand would be on the rise. This however was far from the actual figures, as the male patients constituted slightly less than three percent of the total patient base and the demand reduced between 2010 and 2011. The fact is that the market for male cosmetic surgery in this South African sample is so low that it would not be worthwhile for any hospital or surgeons to focus much of their attention and marketing efforts on male customers.

One interesting fact that did emerge was the preference of cosmetic procedures that male patients, within this sample, preferred. Liposuction was by far the most popular procedure among the male patients and the tummy tuck procedure was the only other procedure with enough procedures done to be significant. This preference indicates that the major reasons for male cosmetic surgery in this population are for weight loss and body contouring. The Chi-Square test indicated that a significant association exists between the choices of procedure per gender, but that the association was weak. Each gender has a very specific list of top three procedures, although it would be difficult to predict the exact choice of procedure for every patient. It does however give us a very good insight into the choice of procedure that the market prefers when considering male and female patients separately.

When looking at the female group it is clear that they are the main customer for any surgeon, hospital or clinic. Therefore, they should be segmented into race, age and choice of procedure for each of the groups. Unfortunately, this study could not consider age due to limited data, but the other two variables have been

used. Table 3 and Figure 5 are thus invaluable to see the specific breakdown of choice of surgery per race group. This information can be used by any facility within the boundaries of Gauteng who wants to better market their services. Again, it must be said that all these efforts must be rooted firmly within the rules of the HPCSA.

The total number of procedures performed on male and female patients was higher in 2010 than 2011, with a marked decrease (33 percent to 12 percent) in total male cosmetic procedures performed. The recession and general poor economic climate in SA has been blamed by most businesses for the fact that people are spending less, and this is most probably the main reason for the general decrease in demand for cosmetic surgery procedures. It is, however, interesting that men would reduce their spending by more than double than that of the women in the sample. A possible reason for this is that men think about cosmetic surgery much more practically, and would reduce their spending on these procedures as part of a general reduction in luxury items (Campana et al., 2012). Women, on the other hand, are much more motivated to change their appearance due to higher societal pressure to look good, and thus value cosmetic surgery more for its benefits (Campana et al., 2012). They are also willing to take more risks in order to get the benefit of cosmetic surgery (Campana et al., 2012).

The findings of this research, with regard to the change in demand for cosmetic surgery in male patients, are in line with work done in the UK in 2004 (Duncan et al., 2004). As was the case in the UK, the change in demand for male cosmetic surgery, as well as the demand in general, was not as dramatic as was expected when looking at the messages portrayed by the media (Duncan et al., 2004). SA and the UK are both historically conservative countries with very specific gender roles, which are emphasized by these findings.

5.2.5 Link between general economic data and procedures performed

The decrease in demand for cosmetic surgery over the two-year period has been attributed to the general state of the South African economy, but has remained an assumption based on logical inference from the literature review. Research done in the US and the UK showed clearly that a correlation exists between certain economic indicators and the demand for cosmetic procedures, as the demand for cosmetic surgery acts like a luxury good in relation to the economy (Krieger & Shaw, 2000; Duncan et al., 2004). The question of which economic indicator has the biggest impact on demand for which procedure has been the cause of various research projects with varying success, although the importance of understanding this relationship is crucial for surgeons going forward (Gordon et al., 2010). This study looked at the relationship between demand figures for cosmetic surgery within the population and various economic indicators that provide an overview of the economy during this period under review. To do this, stepwise linear regression models were used to compare the variables with each other to see if any correlations exist. It must be said that this statistical model does not work well with time-series data, and therefore the data was re-arranged in order to do a study on basic cross-sectional data. Fluctuations in demand for specific cosmetic procedures were thus compared with fluctuations in economic data. The full regression model is shown in Appendix A. Previous studies have shown that economic indicators like GDP, CPI, interest rate and unemployment figures have shown a correlation with demand for cosmetic surgery (Duncan et al., 2004; Liu & Miller, 2008). This study therefore, made use of these indicators in the regression model, but also added share index data from the Johannesburg Stock Exchange. The reason for adding these variables was that figures, such as interest rates, do not change very often, and thus measuring the change of cosmetic surgery demand, as a dependant variable will not be easy when the independent variable has very little fluctuation. Share index data on the other hand changes all the time and it would

be easier to see a correlation when comparing it with changes in demand for cosmetic surgery.

The results of the statistical analysis showed that the three strongest relationships with the total demand for cosmetic surgery were CPI, GDP and the Earnings Yield of the All Share Index (Alsi EY). The relationship between GDP and the demand for cosmetic surgery was weak and showed a positive relationship. This means that when GDP increases, that the demand for cosmetic surgery should also be on the rise. The relationship between these two sets of variables is however too weak to be significant, which is also the case for the Alsi EY. For this reason, these variables will not be explored further in this research.

CPI showed a moderate significant negative relationship and had by far the strongest correlation with total procedures performed. This study proved that a statistically significant relationship exists between these two variables. When CPI figures go up, then it is likely that the demand for cosmetic procedures will show a general decrease. Because the CPI figures are updated monthly, it has a lot more variation in the data and therefore provides results that are more accurate.

CPI figures gives a very good indication of the cost of living for most households, as it represents the fluctuations in price of an average basket of goods and services that most households use. CPI figures usually exclude goods and services of the very rich and very poor in order to give an average figure. It also excludes savings and investments. It is therefore a very good indication of the change in the cost of living for the average middle class household. Considering the literature, the middle class is utilizing cosmetic surgery more frequently and it is no longer reserved for the rich (Wong et al., 2007). It was also shown that the demand for cosmetic surgery behaves like the demand for luxury goods in the economy (Duncan et al., 2004). Hence, if the cost of living (CPI) for the middle class increases, then they would have less money to spend on the luxuries that they would consider otherwise (like cosmetic surgery). The findings of this research is thus in line with the findings of the other studies in the literature review and indicates that patients who consider surgery in Gauteng are sensitive

to changes in CPI and will spend less on cosmetic surgery when prices go up. This also means that a large component of the patient base in the population is made up of middle class citizens. Very rich people would not be so sensitive to changes in CPI.

It is therefore important to look at the relationship between cosmetic surgery and personal wealth and see just how much of the cosmetic surgery population, in this case, is made up of very rich customers.

5.2.6 Economic status and demand for cosmetic surgery

The literature has made it clear that income is no longer a very good predictor of cosmetic surgery demand (Wong et al., 2007). It was shown above that an increasing number of middle class citizens are also having cosmetic surgery, so in order to evaluate the demand for cosmetic surgery among various economic classes it would not be possible to look at demand figures only. Consumer wealth has been shown to be a far better predictor of cosmetic surgery demand (Wong et al., 2011).

The information available about the population in this study did not provide any indication of consumer wealth or level of income. It was therefore necessary to find the best possible proxy for the economic status of the patients that was available. As there was no precedent that could be found in the literature to fall back on, the most logical choice had to be made.

Of the patients in the population 28.8 percent provided the suburb that they live in as part of the basic information given to the hospital, which accounted for 1 238 patients. This amount is still large enough to provide accurate statistical results. A large percentage gave postal information or no information at all, and these were excluded from this part of the study. This is also an indication of the conservative nature of SA, as they would like to keep as much of their personal information private so that only close family and friends are informed of their intention to have a cosmetic procedure. A small part of the population came from other provinces and a few from other African countries. These patients were also

excluded from this section of the study because the hospital's main target market is the Gauteng province, and it is important to be able to have a clean representative sample of this population.

The residential information was used to differentiate the population data, as most people live in the best area that they can afford and the average house price thus gives a good indication of the household's economic status. One of the additional reasons why income is not a good predictor is that a woman who visits a hospital for cosmetic surgery might not be working herself, and her husband would then be paying for the procedure. Income in this case would not be a meaningful measure, but the area in which she and her family lives will give a better indication of their financial situation.

Table 6 indicates the specific classification used to separate the suburbs according to the average house price. This classification used was not based on any formal classification system, but purely on the concept of what is considered expensive to the average middle-class citizen in SA. The table indicates four ratings for average house prices from low to very high, low being a house costing less than R600 thousand and very high being any house more than R2 million. The various cosmetic procedures that each patient had done were then listed alongside their suburb, and the suburb was then substituted for the new classification of economic status based on average house price. Statistical analysis was then performed to test the relationship between these two sets of variables and to see whether this correlation was statistically significant. The Chi-Square test results are also in Appendix A and show a statistically significant correlation between these two sets of variables at a 99 percent level of confidence.

The results show that 85.87 percent of the surgeries performed within the sample are patients who live in areas that are more affluent. Of the surgeries performed, 39.5 percent are patients who live in the suburbs with the highest average house price rating. This confirms the message from the literature that personal wealth is a good predictor of cosmetic surgery demand and that the

wealthy are a big part of the cosmetic surgery market in Gauteng. The more interesting result is the fact that almost 50 percent of all the procedures performed on the patients in the sample are not the people who are extremely wealthy, but rather the class below them. These people would be considered middle-class and up, and this confirms the message even further that the Gauteng market for cosmetic surgery is mainly made up of people who are not considered extremely wealthy, but who have disposable income that they can spend on luxury items like cosmetic surgery. Procedures performed on the patients who come from poorer areas constitute 14.13 percent, with 4.5 percent being performed on patients who live in suburbs with an average house price lower than R600 thousand. This is a very low percentage but shows that people from all classes are becoming aware of the benefits of cosmetic surgery and they are willing to spend large amounts of money on it. For these patients it would be good to test the income-elasticity of demand for certain procedures, as it has been proven that people who are highly motivated to have a procedure done, which might not only be for cosmetic reasons, will do almost anything to get the funds, no matter what their income or financial status (Devgan & Grant, 2010). Unfortunately, this information is not available and will be a very good addition to this study for future research.

5.3 Conclusion

It has been shown that the market for male cosmetic surgery is very low and on the decline, which is most probably a combination of poor economic conditions and a very conservative male market segment. Female patients are by far the biggest segment of the total cosmetic surgery market and should be the focus for any surgeon of cosmetic surgical facility operating in Gauteng.

The most popular procedures for each cultural group within this population has been listed and found to be unique. In order to cater to the needs of such a diverse customer base, facilities will have to start segmenting their markets more clearly and doctors should cater to these specific needs.

CPI has been proven to have a significant impact on the demand for cosmetic surgery in this population, which shows that the market for cosmetic surgery is thus sensitive to the change in cost of living for the average household in Gauteng, SA.

The relationship between demand for surgery and economic status was found to be significant. The middle- to high-class are spending the most on cosmetic surgery in Gauteng and the demand for cosmetic surgery in Gauteng would thus be negatively affected if the general price of goods and services goes up.

This study has thus proven which external factors influence the demand for cosmetic surgery in general, and which internal factors influence the choice of cosmetic procedure in this Gauteng population. There are however a few shortcomings in the research due to a lack of available information and the research being quantitative in nature. A qualitative study on the psychological aspects of cosmetic surgery demand would be an excellent addition to this study. These suggestions and more will be covered in the next chapter.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In this chapter the final concluding remarks of the study are given, followed by the recommendations to the various stakeholders who have been identified for this research. Finally, suggestions for future research, based on the limitations of this study as well as the various factors that have been identified during the research, are of value to the relevant stakeholders in addition to the results of this study.

6.2 Conclusions of the study

Two main trends that have been identified in the US cosmetic surgery market are the increase in incidence of cosmetic surgery on male patients and the pronounced increase of surgeries on all racial groups other than white patients. These two trends do not hold true for Gauteng as the market for male cosmetic surgery is below three percent and not showing any signs of growth, and the market for white female patients is by far the biggest segment and showing the same signs of decline as the other two racial groups. The list of most popular procedures for Gauteng also looks very different to that of the overseas market, which was expected. SA is a very diverse country with many cultures and each has a different idea of what is deemed attractive, so the results of the most popular procedures vary for the different cultural groups within this population.

Of all the external economic data tested against the demand for cosmetic surgery, CPI has the most significant impact on the demand for cosmetic surgery in Gauteng. This result is consistent with the literature and confirms the work done in the UK and the US. The Gauteng market for cosmetic surgery is thus sensitive to the change in cost of living for the average household and thus reacts in a manner consistent with luxury goods in the market. This was however, an expected result and further investigation was warranted. The study

then tested the relationship between demand for surgery and the individual economic status of a sample of the population. It was found that the middle- to high-class are spending the most on cosmetic surgery in Gauteng and this market is thus showing similar changes to the rest of the world where middle-class citizens are utilizing cosmetic surgery more often..

The population in this study consists mostly of patients from the Gauteng province of SA, which includes Johannesburg and Pretoria. This is the main target market of the hospital and therefore the results of this study can be safely inferred for all patients in this province, but not beyond.

There are however a few shortcomings in the research due to a lack of available information and the research being quantitative in nature. Some of these shortcomings could prove to be very good topics for future research and will be discussed at the end of this chapter.

6.3 Recommendations

The first finding that showed any significant result was the choice of procedure per racial group, as indicated in Table 8. The choice in procedure is a very big decision that alludes to the individual trends embedded in each group. Cosmetic surgeons in SA will be able to structure their practices according to the demographic profile of their patient base, if they took heed of this information. This is specifically relevant to hospitals and clinics with large databases, as they can structure unique messages to specific racial groups in order. Although marketing surgical services outright is prohibited by the HPCSA, these hospitals can still send information out to patients about the latest advances in specific procedures. Surgeons could also write articles for magazines with a reader group that fits the demographics that he/she wants to target. Specific tailor-made messages such as these are much cheaper and more effective than traditional marketing and trade publication advertising. At the very least this information will help surgeons to appreciate the diversity of the cultures that make up their

patient base and enlighten them to the fact that cosmetic surgery in SA is most definitely not a one-size-fits-all business.

This research has shown that the market for male cosmetic procedures, specifically in the Gauteng Province of SA, is very small. It is therefore not financially viable for surgeons and hospitals to expend a lot of effort and money to cater for the male segment of the market unless the market shows a marked increase to become at least five percent or more of the total market. Informing weight loss clinics and general practitioners of the services that a facility offers for male patients is enough. The female market, however, should be segmented according to race and age to ensure that the right message goes out to the right people on a facility's database. Surgeons can also write articles for specific magazines that have segmented female readership, and use this as a platform to inform these readers about the procedures most preferred by that demographic. This study provides enough information for surgeons to take action and start speaking to their patients.

This study has shown that the demand for cosmetic surgery in the Gauteng region of SA is sensitive to changes in CPI. Close monitoring of CPI figures will give a good indication of where the demand for cosmetic surgery will be moving. It is therefore suggested that surgeons focus more on their reconstructive patients when the cost of living goes up, as their cosmetic surgery figures will be expected to drop. It might also be a good idea for hospitals and cosmetic surgery clinics to review their pricing structure in order to reduce the cost of cosmetic surgery where possible. Combining procedures to reduce costs is also a good idea to stimulate the market when demand is down and prices of goods and services are up. These discounts can be given to a patient who has a combination of procedures done as staff, facility and disposable costs are less for combining two procedures than if they would be if the procedures are done on two separate theatre lists.

The statistical analysis of cosmetic surgery demand and economic status of a sample of the population showed that more than 80 percent of all cosmetic

surgery procedures in Gauteng are done on patients who live in suburbs where the average house price is more than R1 million. The information of average house prices is easily available on a variety of property websites. It is therefore recommended that surgeons and facilities get involved with advertising and writing articles for local area magazines and papers. Loading company information on online search engines and information websites is also very easy and cost effective and must be seriously considered by all cosmetic surgery facilities, especially in the middle to high-rated suburbs. Talks and articles on local community forums will also increase awareness of cosmetic surgery. When combining the results of this economic status data with information from the literature on the use of technology, it is recommended that cosmetic surgical practices start to communicate with their patients via social media platforms like Facebook. Facebook facilitates very specific communication and numerous research articles have shown that learning about cosmetic surgery from someone you know who had a positive experience is by far one of the most effective ways to positively influence that person's view of cosmetic surgery and ultimately their choice to do it themselves in the future.

Although it was not statistically tested in this research, the data would indicate some form of cyclical pattern to the demand for cosmetic surgery throughout the year. Discussions with the hospital manager has confirmed the notion that patients are much more inclined to have cosmetic surgery, especially procedures such as breast enlargement and liposuction, in the months leading up to the summer holidays and the beginning of the new year. It is ironic that most surgeons choose this time to go on holiday and close their practice when demand is so high. Cosmetic surgical facilities should have at least two surgeons available to consult and operate on patients during the summer holidays, as this will dramatically increase their turnover. It will also provide patients with the necessary recovery time as a lot of industries close and people are forced to take time off even though they have not planned a family vacation. Surgeons, who simply keep in touch with their patient base via social media, for example,

could further investigate the high number of specific procedures that were performed during certain times of the year.

The last recommendation is a more practical one that stems from the advice given to cosmetic surgeons by the University of California in an article published in 2001 (Krieger, 2002). During times of recession, everybody's first instinct is to cut back on all costs and keep their heads down until the economy has recovered. This sounds like the safe route, but it could mean that opportunities are also missed. In difficult economic times, debt is cheap and prices for products are low. This is a perfect opportunity to invest in infrastructure and marketing because it will be very cost effective and could build additional capacity for the future when the economy starts to recover. Never waste a good recession.

6.4 Suggestions for further research

One of the most important influences on demand for cosmetic surgery is the psychological profile and influences on a specific cultural or age group. The results of this research show that various cultural groups have different preferences in types of procedures, which could allude to a very large spectrum of psychological influences on each group. This research did not try to answer any of the questions related to the psychology behind the cosmetic surgery market in SA. There is a very big gap in the understanding of how the cosmetic surgery shopper thinks and represents a perfect opportunity for future research in this field.

A large part of the South African population comes from previously disadvantaged groups, who have been enjoying access to better education and better job opportunities since 1994. This means that more people from previously poor families are experiencing a better way of life, with access to the Internet and mass media messages. Another suggestion for future research is to look at the effect of media exposure to the self-image of later generations of previously disadvantaged groups in SA. The question is whether these groups have gone

through similar trends of change as those that were seen in China at the beginning of the 21st century, when the youth started having access to the internet, causing a major cultural shift in self-image perceptions of beauty (McQuaide, 2010). Media exposure has been quoted in numerous studies as one of the leading causes of dissatisfaction with their own appearance in the female population. Research on this subject is thus very important to the understanding of the choices made by the next generations about cosmetic surgery choice.

A very disturbing trend occurring around the world in the big cosmetic surgery hubs, like the US and Brazil, is the increase in the number of children who are having cosmetic surgery (Maltby & Day, 2011). When gathering the data for this research it was not possible to secure the ages of the various subjects in the census. A good subject for future research would be the changes in age of the cosmetic surgery customer in SA and the possible reasons behind the change, if indeed a shift towards a younger market were occurring. The effect of social media on this market in SA and their choice to have surgery at a younger age should also be considered here.

One of the interesting discussions during the literature review was the income elasticity of demand for various cosmetic procedures when considered separately. Certain cosmetic procedures, like breast reduction for example, have been proven to be inelastic procedures that are not severely affected by changes in income of customers (Devgan & Grant, 2010). This is simply because a procedure such as breast reduction has a physical and health benefit along with a cosmetic one. Some patients struggle with back problems due to abnormally large breasts and they will do anything to get access to the money for the surgery. It was mentioned, that data on patient income was not available for this study, so it is suggested as a subject for future research to look at the income elasticity of demand for various cosmetic surgery procedures.

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APPENDIX A: STATISTICAL TEST RESULTS

Contingency Table

Procedure Name By Race

Count Total % Col % Row %	African	Indian/Coloured	White	
Breast Enlargement	210	41	1480	1731
	4.88	0.95	34.40	40.24
	17.90	20.60	50.51	
	12.13	2.37	**85.50**	
Breast Reduction	307	36	270	613
	7.14	0.84	6.28	14.25
	26.17	18.09	9.22	
	50.08	5.87	44.05	
Breast Uplift	99	6	278	383
	2.30	0.14	6.46	8.90
	8.44	3.02	9.49	
	25.85	1.57	72.58	
Face lift	11	6	27	44
	0.26	0.14	0.63	1.02
	0.94	3.02	0.92	
	25.00	13.64	61.36	
Liposuction	343	68	550	961
	7.97	1.58	12.78	22.34
	29.24	34.17	18.77	
	35.69	7.08	57.23	
Nose Job	2	0	5	7
	0.05	0.00	0.12	0.16
	0.17	0.00	0.17	
	28.57	0.00	71.43	
Tummy Tuck	201	42	320	563
	4.67	0.98	7.44	13.09
	17.14	21.11	10.92	
	35.70	7.46	56.84	
	1173	199	2930	4302
	27.27	4.63	68.11	

Tests

N	DF	-LogLike	RSquare (U)
4302	12	267.54693	0.0820

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	535.094	<.0001*
Pearson	519.303	<.0001*

Count Total % Col % Row %	2010	2011	
African	638 14.83 27.85 54.39	535 12.44 26.60 45.61	1173 27.27
Indian/Coloured	111 2.58 4.85 55.78	88 2.05 4.38 44.22	199 4.63
White	1542 35.84 67.31 52.63	1388 32.26 69.02 47.37	2930 68.11
	2291 53.25	2011 46.75	4302

Tests

N	DF	-LogLike	RSquare (U)
4302	2	0.79059470	0.0003

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	1.581	0.4536

Contingency Table

Procedure Name By Gender

Count	Female	Male	
Breast Enlargement	1724	7	1731
Breast Reduction	605	8	613
Breast Uplift	383	0	383
Face lift	42	2	44
Liposuction	897	64	961
Nose Job	6	1	7
Tummy Tuck	545	18	563
	4202	100	4302

Tests

N	DF	-LogLike	RSquare (U)
4302	6	60.886554	0.1282

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	121.773	<.0001*
Pearson	126.833	<.0001*

Contingency Table

Gender By Year

Count Total % Col % Row %	2010	2011	
Female	2231 51.86 97.38 53.09	1971 45.82 98.01 46.91	4202 97.68
Male	60 1.39 2.62 60.00	40 0.93 1.99 40.00	100 2.32
	2291 53.25	2011 46.75	4302

Tests

N	DF	-LogLike	RSquare (U)
4302	1	0.94399536	0.0003

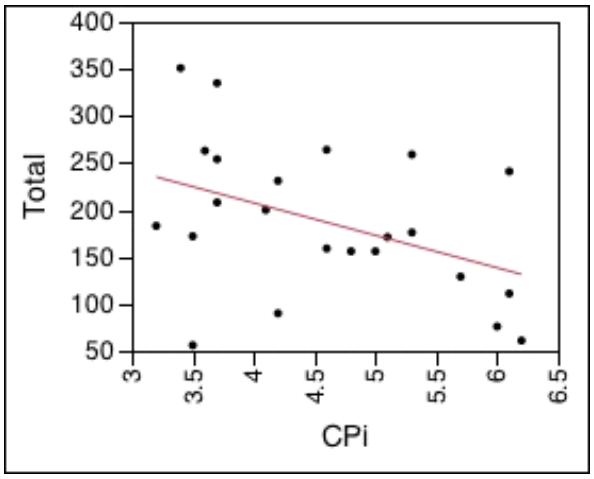
Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	1.888	0.1694
Pearson	1.871	0.1713

Multivariate

Correlations

	Total	Breast Enlargement	Breast Reduction	Breast Uplift	Face lift	Liposuction	Nose Job	Tummy Tuck
Total	1.0000	0.9602	0.8322	0.8399	0.3251	0.8860	0.0800	0.8381
Breast Enlargement	0.9602	1.0000	0.7172	0.7231	0.3441	0.8475	0.1838	0.8017
Breast Reduction	0.8322	0.7172	1.0000	0.6453	0.1518	0.6289	-0.0835	0.5839
Breast Uplift	0.8399	0.7231	0.6453	1.0000	0.3398	0.7961	-0.0204	0.7313
Face lift	0.3251	0.3441	0.1518	0.3398	1.0000	0.1173	0.4340	0.4501
Liposuction	0.8860	0.8475	0.6289	0.7961	0.1173	1.0000	-0.1855	0.6352
Nose Job	0.0800	0.1838	-0.0835	-0.0204	0.4340	-0.1855	1.0000	0.3709
Tummy Tuck	0.8381	0.8017	0.5839	0.7313	0.4501	0.6352	0.3709	1.0000
CPi	-0.4236	-0.2755	-0.5833	-0.4562	-0.1999	-0.3253	0.3574	-0.3003
GDP	0.2080	0.1542	0.4165	0.1895	-0.3282	0.2918	-0.4646	-0.2145
Interest rate	-0.0535	-0.1262	-0.1540	0.1059	-0.1276	0.3154	-0.3761	-0.2502
Unemployment	-0.1543	-0.1765	-0.2791	-0.1318	0.2206	-0.1411	0.1965	0.1605
J203 - Alsi Value	-0.0688	0.0135	0.0571	-0.1729	0.0699	-0.4107	0.3395	0.0894
J203 - Alsi TRI	-0.0758	0.0161	0.0321	-0.1950	0.0714	-0.4142	0.3703	0.0978
J203 - Alsi DY	-0.1571	-0.0280	-0.2116	-0.3461	0.0846	-0.3365	0.4739	0.0791
J203 - Alsi EY	-0.1945	-0.0547	-0.2307	-0.4161	-0.0341	-0.3236	0.2879	-0.0105
J303 - Capi Value	-0.0690	0.0160	0.0515	-0.1776	0.0731	-0.4107	0.3469	0.0938
J303 - Capi TRI	-0.0760	0.0179	0.0273	-0.1988	0.0742	-0.4136	0.3758	0.1011
J303 - Capi DY	-0.1659	-0.0372	-0.2149	-0.3501	0.0925	-0.3522	0.4746	0.0739
J303 - Capi EY	-0.1806	-0.0437	-0.2160	-0.4020	-0.0423	-0.3087	0.2850	-0.0015
J403 - Swix Value	-0.0783	0.0091	0.0347	-0.1894	0.0828	-0.4160	0.3531	0.0924
J403 - Swix TRI	-0.0843	0.0127	0.0086	-0.2098	0.0831	-0.4164	0.3850	0.1023
J403 - Swix DY	-0.1803	-0.0398	-0.2225	-0.3680	0.0607	-0.3826	0.5094	0.0579
J403 - Swix EY	-0.1218	0.0015	-0.1082	-0.3937	0.0100	-0.2874	0.3072	0.0389

Response Total
Whole Model
Regression Plot



Summary of Fit

RSquare	0.179413
RSquareAdj	0.140338
Root Mean Square Error	74.71789
Mean of Response	187.0435
Observations (or Sum Wgts)	23

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	25632.95	25632.9	4.5914
Error	21	117238.01	5582.8	**Prob> F**
C. Total	22	142870.96		0.0440*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	14	74893.84	5349.56	0.8843
Pure Error	7	42344.17	6049.17	**Prob> F**
Total Error	21	117238.01		0.6018
				Max RSq

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	345.65538	75.64385	4.57	0.0002*
CPi	-34.54615	16.12223	-2.14	0.0440*