CHAPTER 1: INTRODUCTION

1.1 Introduction

Legend has it in ancient Greek mythology that Prometheus who was chained to a rock had his liver eaten by an eagle, but his liver grew back every night only to be eaten by the eagle the following day. This ancient mythology relates to the property of liver to self-repair and to regenerate. This is exactly what scientists are working on in today’s biotechnological era in the field of regenerative medicine. In regenerative medicine, stem cells are introduced into a person’s body to differentiate into specific tissue to repair or replace damaged tissue. Scientists conduct extensive research to investigate how stem cells can be used in the treatment of diseases and to advance knowledge on how cells develop and repair itself.

Stem cells have the ability to continuously divide and differentiate into various other kinds of cells and tissues. Stem cells are different from other cell types, mainly because (1) they are unspecialised cells, capable of renewing themselves through cell division, and (2) they can be induced to give rise to specialised tissue or organs with special functions (United States National Institutes of Health, 2009). Given their unique regenerative capabilities, stem cells offer potentials to treat diseases.

Embryonic Stem Cell Research (ESCR), is an evolving area of research with numerous scientific breakthroughs taking place around the world. This study, however only, takes into consideration the ethical issues and developments up to January 2015. The researcher has strived to present the complexity and contentious issues surrounding ESCR, in the most comprehensible manner, as possible.

Throughout this study, Embryonic Stem Cell Research (ESCR) refers to the human embryonic stem cell (hESC) research, that is use of human embryos in stem cell research. Thus both terms are to be treated synonymously.
This study recognises that the words fertilisation and conception are being used interchangeably. Conception is taken as synonymous with fertilisation although fertilisation is a biological term and conception need not be (McCormick, 1991).

The word pre-embryo is used by some scholars to indicate the early embryonic stage prior to implantation. The term pre-embryo refers to the period from start of fertilisation until formation of primitive streak (Eisenberg & Schenker, 1997). Primitive streak marks the start of gastrulation, where the inner cell mass (ICM) is converted into the three germ layers – ectoderm, endoderm and mesoderm. The ectoderm gives rise to neural tube, the precursor to central nervous system. The term ‘pre-embryo’ is used to indicate the earliest stages of mammalian development which involves ‘establishment of the non-embryonic trophoblast’ (McCormick, 1991).

According to the definition in the Encyclopaedia of Bioethics:

The pre-embryo comes into existence with the first cell division, and lasts until the appearance of a single primitive steak, which is the first sign of organ differentiation occurring [around] 14 days of development, after which the word embryo can be applied (Reich, 1995, p.847)

However, according to Doerflinger (2002), the term pre-embryo has been dropped from recent textbooks as many feel that the term serves more political purpose. The term ‘pre-embryo’, referring to embryo prior to implantation never gained general acceptance, as opponents of embryo research sees it as an attempt to deny that embryo exist from moment of fertilisation (Sagan & Singer, 2007).

In this study, wherever possible, the word embryo is used to refer to the five-day old ‘pre-embryo’ or ‘early embryo’. In medical parlance, an embryo refers to an organism in early stages of growth and differentiation from time of fertilisation up to 90 days. Throughout this study, the term ‘blastocyst’ refers to a 4-5 day old embryo.
formed prior to implantation, made up of about 150 cells, consisting of a hollow mass of undifferentiated stem cells.

1.2 Background of the study

This chapter provides an overview of the study. It begins by setting out the context of the study. This is followed by the statement of problem, objectives and research questions which this study wishes to address. Significance of the study is discussed and the research methodology is briefly described. This is followed by an introduction on stem cell research. The science of stem cells and world policies associated to embryonic stem cell research (ESCR) are discussed. An outline of the study is provided at the end of this chapter.

The potential for research on human embryonic stem cell (hESC) has created new frontiers in biomedicine like never before. Such cells have been found to be able to replace damaged body cells and tissues and have offered breakthroughs and innovation in the medical enterprise. Embryonic stem cells are said to provide treatment for debilitating diseases such as Parkinson’s disease (Kim et al., 2002; Freed et al., 2001), Alzheimer (Abe et al., 2003; Wichterle, Lieberam, Porter, & Jessell, 2002), and type 1 diabetes (Street et al., 2004). In addition to that, embryonic stem cells can be used to treat other health conditions such as spinal cord injury, cancer, and juvenile-onset diabetes (United States National Institutes of Health, 2009). Other than leading to development of therapies for many diseases and illness affecting millions of people all over the world, stem cell research also provides a host of knowledge and clearer understanding of human organism.
However, ethical questions\textsuperscript{1} are inevitably raised. Theologians and religious scholars are actively debating the ethical issues pertaining to the use of human embryos in research in which the embryos are inevitably destroyed. The ethical conflict exists between the nature of ESCR which results in the destruction of human embryos and the enormous possibilities of the research in offering treatments for various diseases (Mc Laren, 2001).

The controversies arise because the process of extracting stem cells from blastocyst eventually leads to its destruction (de Wert & Mummery, 2003; Lo & Parham, 2009). The objection to ESCR is due to the fact that the research deprives the embryo’s potential to develop into a human being (United States National Research Council Report, 2001).

The extraction of stem cells from embryos elicit ethical dilemma among proponents of life, who believe that life begins from the moment of conception. Hence, ESCR is said to violate the principle that prohibits destruction of life (United States National Research Council Report, 2001, p.44). A five day old embryo is a nascent life and warrants the same moral status, and protection, as that accorded to a human person. Based on this, proponents of life object to ESCR. However, Nickel (2008, p. 70) points out that those opponents of ESCR claiming that human embryos have the same moral standing with human persons, are basing it upon religious convictions.

On the other hand, supporters of the developmental view believe that moral status increases gradually with stages of human development, and that the moral status of embryos increases gradually as they grow in utero. Thus, this may be taken to mean that a five day old embryo which comprises a mass of cells, lacks moral status. There is another argument along the same line, that the embryo in the petri dish cannot be accorded the same moral status as the one implanted in a woman’s womb.

\textsuperscript{1} See Chapter 2 for a detailed discussion on ethical issues surrounding ESCR.
Referring to the biological development of an embryo, twinning at a later embryonic stage, has been used to suggest that embryos presumably lack the individuation. The nature of embryo and possibility of twinning has been forwarded to reject the view that the embryo has a future value, and therefore the moral objection towards hES research is not compelling (Marquis, 2007, p.65).

Biologically, it has been argued that the moral concern of harming the embryo does not arise because a five day old embryo has not developed the primitive streak as a precondition for a developing conscious being. The five-day old embryo has not developed a nervous system and thus it cannot sense pain.

Miller (2008, pp. 153-154) recognises the two major societal disagreements for ESCR. The first one is the degree of respect due for a blastocyst and whether it can be destroyed in research for therapeutic purposes. The second disagreement is that some believe the use of ‘non-embryonic’ stem cells such as the adult stem cells will put an end to the ethical dilemma of employing embryonic stem cells for research. This was also popularised by notable proponents of life, among others, Kass, the strong voice in the United States President’s Council on Bioethics, whose opinion was solicited on matters concerning ESCR by the then President Bush. Realising the pluripotency of stem cells for medical research, Kass led the council to survey and discuss alternative sources of human pluripotent stem cells without having to destroy human embryos in the process. A pluripotent cell may differentiate into all types of cells and tissues and into derivatives of the three germ layers ectoderm, mesoderm, and endoderm. In his report to the Washington Post on “A way forward on stem cells’, Kass was hopeful that a technological solution will soon put to an end to the ethical dilemma concerning the destruction of human embryos for stem cell research (Kass, 2005).

This study examines the ethics of utilising human embryos, created via in vitro fertilisation (IVF) namely (i) excess or leftover embryos from infertility treatments
denoted as ‘surplus embryos’, and (ii) embryos created specifically for research purposes or what is termed as ‘research embryos’. The use of surplus embryos is expected to carry a different and perhaps, ‘lighter’ moral connotation than the use of research embryos because surplus embryos are not intentionally created but readily available for use from the infertility treatments whereas research embryos are created by the scientists to embark on research. The creation of research embryos may go against the principle of respect for the dignity of human beings. Scholars argue that while using research embryos is regarded as unethical, the use of surplus embryos is deemed ethically acceptable because this demonstrates that proper respect is given to these entities by using them for good reasons, rather than discarding them and letting them go to waste. The United States National Bioethics Advisory Commission (USNBAC) also states that, research which inevitably involves the destruction of surplus embryos, is acceptable as it may develop cures for life-threatening or severely debilitating diseases (NBAC, 1999).

As for respecting human embryos, the argument is that rather than letting the embryos go to waste, using them to save lives, is a way of treating the embryos with respect. Thus, to use surplus embryos instead of discarding it, for research that has the potential to benefit lives of human beings are encouraged (Manninen, 2007, p. 100). In fact, respect for surplus embryos is manifested by using them in research which gives their existence a [positive] impact on the world (Manninen, 2007, p. 101).

Scholars also examine whether utilising surplus embryos for research shows a lack of respect to the embryos, and also whether using research embryos generates more ethical constraints than using existing surplus embryos (Hug, 2005). Noting that the embryonic stem cells can be derived from surplus embryos from infertility treatments, or derived from research embryos created solely for research purposes via IVF,
Steinbock (2000) argues that there is no moral difference between utilising surplus embryos and research embryos for stem cell research.

The important controversy highlighted here is the fundamental issue and focus point of this study, which is whether it is morally wrong to create an embryo for research purposes which inevitably destroyed in the process, with no intention to create babies. The ‘discarded-created distinction’ has been forwarded stating that there is a moral difference between doing research on surplus embryos originally created for reproduction purpose, with the research embryos created with the intention of only using them for research (Parens, 2001). The latter however raises more ethical controversies.

Precisely, the ethical considerations on ESCR rely on the source of embryos used. A report in the United States recognises that while one viewpoint would allow the use of existing embryonic stem cell lines but prevent further derivation of embryonic stem cell lines, another would permit the use of surplus embryos in research, and still another viewpoint that permit the use of stem cells derived from research embryos created specifically for research from eggs and sperms donated by donors (United States National Research Council Report, 2001). Accordingly, each of this poses its own ethical dilemma. The moral justifications surrounding the advances in biomedical research which include:- healing the sick, aiding the suffering, love of knowledge, obligation to heal the sick, and the medical promises in understanding human diseases and offering potential treatments - are among the key points highlighted in a report by the United States President’s Council on Bioethics (2002, Ch. 6).

In a multi-religious and multi-cultural country like Malaysia, ethical discussions pertaining to the morality of ESCR has taken a different outlook given the diverse views within and among the religious traditions. The morality of ESCR varies considerably according to religious interpretations on moral status of human embryo. The matter on
the use embryos was referred to the decision of the Malaysian Fatwa Council dated 22nd February 2005, during its 67th sitting (Department of Islamic Development Malaysia, 2005). Accordingly, frozen surplus embryos from IVF trials may be used for research if parents consent; however, the creation of human embryos solely for research is prohibited (refer Appendix A and B). Apart from Islamic views, the input from other main religions in Malaysia is yet to be documented.

Hence, this study intends to explore the ethics of ESCR in Malaysia from the perspectives of Buddhist, Hindu and Catholic leaders and their ethical reasoning in regards to use of surplus and research embryos.

1.3 Statement of Problem

Most of the views in the Western literature pertaining to ethics of embryo research, which are secular in nature, are not applicable to Malaysia, a country with multi-religious and multi-cultural setting. The current ethical discussions are framed within the context of the West. Views debated in Western literature on ethics of embryonic stem cell research revolve around moral status, personhood and potentiality of embryo². This study attempts to study the ethics of ESCR according to the religious perspectives of the major religions in Malaysia. Two domains of inquiry or values from the vantage point of (I) sanctity of life, and (II) research is a knowledge-seeking endeavour, have been identified from the literature (reviewed in Chapter 2), as a guideline and starting point of the investigation.

Noting the diversity of views in a pluralistic society in Singapore, Elliott, Ho, and Lim (2010) stated that something that is deemed ethical in one place may not be
deemed ethical in a different cultural and religious context. Likewise, Turner (2004) asserts that in a pluralistic society made up of multicultural and multi-faith, there exists varying interpretations of what constitutes ethical practice. Religions have become the integral part to ethical debates, giving rise to distinctive deliberations pertaining to medical advancements such as ESCR. The UNESCO’s report issued by the International Bioethics Committee in 2001 on *The Use of Embryonic Stem Cells in Therapeutic Research* recognises the diverse opinions reflecting pluralism on matters concerning ESCR, and the various solutions adopted by different nations. This is where ethical debate facilitating the resolution at national and international level is paramount (UNESCO IBC, 2001).

The world renowned Hindu monk, Swami Vivekananda (1863-1902) has said that ‘the voice of Asia is the voice of religion’. Akabayashi, Kodama and Slingsby (2010) have stated that Asia which comprises the largest number of countries, cultures, and religious traditions, is the birthplace of most of the world’s religious traditions; Hinduism is the oldest of several religions that originated in South Asia, and Buddhism emerged in the 6th century. The Abrahamic traditions which are Judaism, Christianity and Islam originated in Southwest Asia. This diversity results in a spectrum of values and religion continues to influence the ethics system of the countries (Akabayashi et al., 2010, p. 1-3). Malaysia, being an Asian country, has a different demography and cultural environment as compared to the West. Based on the last census in 2010, the population in Malaysia is made up of 61.3% Muslims, 19.8% Buddhists, 9.2% Christians and 6.3% Hindus (Department of Statistics Malaysia, 2010). Islam is the official religion as enshrined in Article 3 of the Federal Constitution of Malaysia, but other religions are allowed to be practiced in harmony. As Malaysia is a nation of various culture and religions, whose citizens have a firm belief in God and/or a superior Power, and make references to the embodied sacred texts on issues concerning life and
death, how is the contentious issue concerning human embryos being inevitably destroyed in stem cell research addressed?

In Malaysia, scientists actively conduct research using human adult stem cells. However, in anticipation of the ethical issues that may arise should scientists advance into human embryonic stem cell research, the 2009 *Guidelines For Stem Cell Research and Therapy* was prepared by Stem Cell Research and Ethics Subcommittee of National Stem Cell Committee in collaboration with the Obstetric & Gynaecological and Paediatric Services Unit of the Medical Services Development Section of the Ministry of Health Malaysia (MOH, 2009a). The matter on the use of surplus embryos was referred to the decision of the Malaysian Fatwa Council dated 22nd February 2005, during its 67th sitting (Department of Islamic Development Malaysia, 2005). Accordingly, frozen surplus embryos from IVF trials may be used for research if parents consent; however, the creation of human embryos solely for research by any means including Assisted Reproductive Technology or through Somatic Cell Nuclear Transfer (SCNT) is prohibited (refer Appendix A and B). This is in line with the *fatwa* issued by three Islamic Fiqh (Jurisprudence) Councils in Jeddah, USA and Jordan (Nordin, 2011).

The 2009 *Malaysian Guidelines for Stem Cell Research and Therapy* was obviously influenced by the *fatwa* ruling. In the acknowledgement section of the Guidelines (p.70), the committee extended its gratitude to the Department of Islamic Advancement Malaysia (JAKIM), Islamic Medical Society of Malaysia, and Malaysia Consultative Council of Buddhism, Hinduism, Sikhism & Taoism (MCCBHST), and non-governmental organisations (NGOs) for their constructive comments on the formation of draft. The committee also thanked the participants of the Public Forum on Stem Cell Research in Ampang Hospital in October 2008 for their valuable input and

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3 See Section 1.9.2 for the scientific aspect of SCNT, a cloning technique.

4 It is worth mentioning that Dr Musa Nordin is a medical practitioner by profession, and also the former President of the Islamic Medical Association of Malaysia, whose views are consulted by the local *fatwa* committee pertaining to medical ethics.
feedback (MOH, 2009a). However, the report does not offer any insight to the views and input gathered from the religious representatives. The guidelines did not state which are the NGOs involved in drafting the guidelines. Furthermore, there were no references made in regards to the perspectives of these religious groups. The Malaysian guideline has only made reference to the fatwa ruling. As such, the absence of documented views from these major religions in Malaysia, needs to be acknowledged, at this juncture. The differences and commonalities of views among the faiths need to be solicited. Thus, this study seeks to explore the religious perspectives and standpoints pertaining to ethics of stem cell research.

Apart from Islamic views, the input from other main religions in Malaysia is yet to be documented. Acknowledging this gap, I believe that this study on ethics of ESCR from the perspectives of Buddhist, Hindu and Catholic (representing the major denomination of Christianity) leaders, will be able to contribute towards knowledge building. In Malaysia, religions play a major role in influencing the ethical guidelines for scientific research. Hence, it is important that a comprehensive study is carried out to study the ethical considerations that stem from the main religions in a multi-faith country like Malaysia.

In the past, evolving medical issues such as abortion, and organ transplantation, have been scrutinised by religious councils in Malaysia. For example, in 2011, the Ministry of Health collaborating with the Department of Islamic Development Malaysia (JAKIM) released a report deliberating on Organ Transplantation from the Islamic perspective (MOH, 2011). Issues like abortion and cloning are also widely discussed by religious representatives in local seminars and workshops in hospitals⁵.

That is why it is pertinent for this study to gather and study the ethical viewpoints of the various religious leaders from the Buddhist, Hindu and Catholic

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⁵ This information is confirmed during my correspondences with respondents of this study. See Chapter 3 for details of respondents.
groups pertaining to ESCR in Malaysia. The study will also examine the fundamental arguments that arise from those religions in regards to ESCR. While the three religions have different belief systems, there exist common values and principles within the same faith and among various faiths; which will be examined in this study. This study also wishes to examine the standpoint of the religious leaders on Malaysia pertaining to ESCR with regards to the use of (i) surplus and (ii) research embryos.

The views debated in Western literature on ethics of ESCR revolve around moral status, personhood and potentiality of embryo. A different approach needs to be taken to study the ethical issues raised in a multi-religious nation like Malaysia with regards to embryo research. As such, it has become a necessity to study the ethical standpoints and religious perspectives on ESCR in Malaysia.

Thus, this study essentially presents on the ethics of ESCR representing the local flavor of Buddhist, Hindu and Catholic community. Since the Malaysian Muslims belonging to the Sunni-Shafie school of thought have already adopted a consensus on ESCR through the formulation of a national fatwa, the views of the local Islamic leaders are not gathered through active inquiry but rather through a review of literature comprising of both local and international publications.
1.4 Objectives of Study

The objectives of the study are:

(a) To explore the ethical considerations pertaining to Embryonic Stem Cell Research (ESCR) in Malaysia, specifically from the Buddhist, Hindu and Catholic perspectives.

(b) To investigate the ethical viewpoints of the Buddhist, Hindu and Catholic leaders with regards to the use of the two sources of human embryo - surplus embryos and intentionally created research embryos for ESCR in Malaysia.

(c) To examine the fundamental arguments and standpoints that arises from the Buddhist, Hindu and Catholic faiths pertaining to ESCR, with regards to obtaining consensus in Malaysia.
1.5 Research Questions

(a) What are the main values and moral principles that guide the decision-making process pertaining to ethics of ESCR in Malaysia?

(b) What are the similarities and differences within these religious perspectives (Buddhist, Hindu and Catholic)?

(c) What is the position taken by each religion? (Islam, Buddhist, Hindu, and Catholic faiths) on ESCR in Malaysia?

(d) What is the response of the religious leaders in recognising the value systems of various religions in Malaysia with regards to obtaining a consensus on ESCR?

(e) What are the possible recommendations that may be gathered from these religions pertaining to ESCR in Malaysia?
1.6 Significance of Study

This study which takes into account the various religious considerations on the use of embryos in stem cell research, is significant as it will be useful in terms of developing a comprehensive policy on ESCR in Malaysia in the near future. There is tremendous growth of activities related to stem cell research both in the public and private organisations like universities, hospitals and healthcare in recent years. Little is known about the religious standpoints of the local religious leaders in Malaysia as far as ESCR is concerned with regards to the use of (i) surplus and (ii) research embryos. Therefore, a study taking into account the various ethical and religious considerations pertaining to ESCR is pertinent at this point of time. This study is expected to give an insight into the matter.

In an article in a local daily in June 2012 titled “R&D: Improving well-being without compromising social values”, the following was highlighted:

In 2006, Malaysia became one of the earliest signatories to UNESCO’s Universal Declaration on Bioethics and Human Rights…Despite already having the Medical Review & Ethics Committee (MREC) under the Ministry of Health…, there was no overall structure that can unify all the other issues of bioethical concerns in the past until the launch of the National Bioethics Council in May [2012]  (New Straits Times, 2012).

As such, this study is timely with the launching of the National Bioethics Council in Malaysia in May 2012. The council aims to provide advice and resolve bioethical issues in the country, and promote ethics in science and technology as not to contradict the impact on human and moral values, with regards to environment, social, health, culture, laws, and religions (Ongkili, 2012). The council’s general focus would be on technological applications such as stem cell, genetically modified organism, and
animal testing, in line with the Universal Declaration on Bioethics and Human Rights signed by Malaysia in 2006. The Declaration which was adopted at the 33rd session of the General Conference of United Nations Educational, Scientific, and Cultural Organisation (UNESCO) on 19th October 2005, is the first international legal, non-binding instrument which recognises the inter-relation between ethics and human rights, in search for global standards in biomedical practice (UNESCO, 2005). Article 19 of the Declaration spells out the need to establish an independent, multidisciplinary and pluralist ethics committee to assess relevant issues related to projects involving human beings, to provide advice on clinical settings, to formulate recommendations and guidelines, and to foster debate and public awareness in bioethics (UNESCO, 2005, p.10). Hence, the establishment of Malaysia’s National Bioethics Council in May 2012 is in line with Article 19 of the aforementioned Declaration. The council comprises experts from various fields, policy makers, government agencies, and non-governmental organisations such as the interfaith council.

With that in mind, this study seeks to explore the religious considerations on ethics of ESCR, representing the Buddhists, Hindus and Catholics of a pluralistic society in Malaysia, in the hope that the findings of this study will enable the government to come up with a more comprehensive ethical framework on ESCR. By placing the findings of this study alongside with the Islamic fatwa on ESCR, it is hoped that the government will be able to facilitate regulation of research in the field of biotechnology in general, and in stem cell research in particular.

This is the first study which gives emphasis on gathering views from the non-Muslim section of the Malaysian population with regards to use of (i) surplus and (ii) research embryos in ESCR. My personal communications with the interviewees who are the religious authorities, confirmed that their views and positions on the utilisation of surplus and research embryos in ESCR have not been formally solicited.
This study also builds up on previous studies which largely concentrate on moral status of embryo. In addition, the research data gathered from the interviews led to the emergence of a new theme (as discussed in Chapter 4) - which has not been highlighted in the Western literature. Thus, this study opens new frontiers in bioethics discussion concerning stem cell research in a pluralistic society in light of religious beliefs as embodied in sacred texts.

Past studies on ESCR have mainly been through the lens of Western bioethics. It is hoped that this study which explores the perspectives of the religious leaders within a multi-faith society, will be beneficial to the international bioethics community by providing guidelines to neighbouring countries like Singapore, Thailand, Indonesia, India, and Philippines where there are a significant number of Buddhists, Hindus, or Catholics, in embarking on evolving biomedical technologies. In an editorial published in Asian Biomedicine in 2014, the editor expressed concern over the growing number of stem cell treatment centres and turning them into lucrative business across Asia in countries like Thailand, Malaysia, India, Philippines, China and Hong Kong. Thus, there is a need for the government and authorities to monitor the unethical practices (Editorial Asian Biomedicine, 2014). The fear over unethical practices reinforces the view that there is a need to study and monitor all matters related to ESCR. Therefore, ethical discourses on ESCR, is undoubtedly important to be explored at the present time.
1.7 Research Methodology

This is a qualitative study comprising face-to-face, semi-structured and in-depth interviews with the religious leaders from the Buddhist, Hindu and Catholic groups. The purpose of these interviews was to gather the ethical concerns of these leaders on ethics of ESCR in Malaysia.

Prior to the interviews, an extensive review of literature comprising journal articles, books, book chapters, religious texts, international reports, and newspaper articles was undertaken. This enabled the researcher to identify the underpinning issues surrounding ESCR and to derive the conceptual framework (in Chapter 2). The conceptual framework served as a guideline for the researcher to formulate the interview questions.

The respondents were identified through a ‘purposive sampling’. A detailed account on the research methodology, sample size and profile of respondents, is discussed in Chapter 3. This researcher made arrangements with the respondents via email and telephone calls, either weeks or months in advance before the interviews. The respondents were also notified about the purpose of the interview and the background of the study through emails. The respondents signed the consent forms, and agreed to participate in this study. The interviews were conducted within Kuala Lumpur and Klang valley between May to December 2012. In semi-structured interviews, the questions only serve as a general guide, as the flow of the conversation with the respondents is not restricted.

The interviews, in English, were audio-recorded and transcribed verbatim. The interview transcripts were then analysed by the researcher, and themes were identified from the data, as discussed in Chapter 4.
1.8 Scope and Limitations of Study

(a) Scope

For the purpose of this study, I will only be concentrating on the two sources of embryos created via IVF, namely (i) surplus embryos and (ii) research embryos. This study primarily investigates the ethical concerns of creating and/or manipulating embryos for ESCR. This study also explores the ethical viewpoints of the local religious leaders with regards to the use of both the sources (i) and (ii) in ESCR.

This study does not intend to dwell on whether the embryos in Malaysia are imported or otherwise as national resources on this matter remain confidential and beyond reach.

No attempt was made to conduct a survey among the lay public because it would require a large sampling survey, and it is beyond the scope of this study to seek lay perspective. Moreover, public engagement on issues like ESCR is still in its infancy stage in Malaysia. This study exclusively intends to seek the perspectives of religious leaders in authority. The respondents participated in this study represent their respective religious community.

This study also did not seek the perspectives of the scientists or medical practitioners involved in stem cell research. My initial attempts to approach them showed that the medical practitioners are reluctant to discuss ESCR from the ethical or moral perspective. It is beyond the scope of this study to look into scientists’ perspectives on ESCR in Malaysia given the constraints to engage with them in a bioethical discussion. Moreover, the aim of this study has always been to examine to what extent religions influence the practice of ESCR in Malaysia, and to examine the ethical standpoints of the religious leaders from the Buddhist, Hindu and Catholic traditions.
It is also beyond the scope of this study to:

(i) discuss the commercialisation of gametes in producing *in vitro* research embryos.
(ii) examine the ethical concerns regarding production of cloned embryos through SCNT technique (a cloning technique).
(iii) deliberate the metaphysical context of existence of life, as the main focus of this study remains in exploring the ethical perspectives of ESCR in a multi-faith setting in Malaysia.
(iv) discuss the pros and cons of non-embryonic stem cells such as adult stem cells and induced pluripotent stem (iPS) cells
(v) discuss the legal issues concerning ESCR in Malaysia
(vi) propose a framework for policies related to stem cell research

(b) **Limitation(s)**

This study focuses on the major religions in Malaysia (which are also among the major religions in the world). However, this study is only limited to Buddhism, Hinduism and Catholicism. Within Buddhism, the participants of this study are from Theravada school of thought, one of the major branches of Buddhism practiced in Malaysia. This study did not seek the perspectives of the religious leaders from other beliefs such as Sikhism and Taoism, as not to broaden the scope of this study.

Interviews were not conducted with the Muslim authorities as there is already a *fatwa* on the use of surplus embryos in stem cell research in Malaysia. However, both local and international works on Islamic ethics of ESCR were reviewed. This study only focuses on the two Islamic principles which are extensively cited in literature, (i) sanctity of life, and (ii) research is a knowledge-seeking endeavour. Other principles are not featured in this study as it is beyond the aim of this study to examine the Islamic
framework and the contribution of Islamic ethics on this matter. This study embarks on Islamic ruling (fatwa) but extends into local ethical deliberation to include the perspectives of Buddhist, Hindu and Catholic groups only.

This researcher acknowledges the existence of various denominations within Christianity, such as Roman Catholic, Methodist, Lutheran, Anglican and Presbyterian. However, my respondents are from the Catholic tradition only, being the major denomination, with a recognised and structured official authority in Malaysia. In 2010, Catholics surpassed one million, covering 3% of total population and 40% of the 2.2 million Christians in Malaysia (Herald, 2012).

This researcher has no access to the national records on the sources of embryos and how they are retrieved for ESCR – which is to be taken as a limitation.

The literature was on embryo research for the last three decades were explored, but the main focus was only on the literature after year 1998 (after the discovery of hESC), where a plethora of papers were published pertaining to this subject matter.

In qualitative study, the personal moral reasoning and prevailing attitudes of respondents might be unavoidably reflected. Respondents expressed their views and understanding of various sacred texts and holy books with regards to ESCR, but care was taken to exclude any personal moral reasoning.

It is hoped that despite these limits, this study could strike new grounds on the ethical discourse in Malaysia, specifically to the practice of ESCR.
1.9 Introduction to Stem Cell Research

A study on the ethics of ESCR has to look into the science of stem cell research (SCR), which is described in this section.

1.9.1 Sources of Stem Cells

Sources of stem cells include (i) adult stem (AS) cells, (ii) induced pluripotent stem (iPS) cells, (iii) embryonic stem (ES) cells and (iv) embryonic germ (EG) cells. As the name suggests, AS cells are derived from mature adult organism, iPS cells are adult stem cells that have been reprogrammed genetically, ES cells are harvested from the inner cell mass of pre-implantation embryo, and EG cells derived from primordial germ cells.

Adult stem (AS) cells are undifferentiated cells found throughout the body such as the brain, bone marrow, peripheral blood, skeletal muscle, mesenchymal cells, liver, pancreas, epithelial skin, and digestive system, among others. The role of adult stem cells is to multiply by cell division to repair the tissue where they originate from. Scientists refer to adult stem cells as somatic stem cells, referring to the cells of the body except sperm, egg and germ cells (United States National Institutes of Health, 2009). Scientists report that adult stem cells enter ‘normal differentiation pathways’ to generate specialised cell types of the tissue they reside. For instance, hematopoietic stem cells give rise to all types of blood; mesenchymal stem cells give rise to a variety of bone cells, cartilage cells and fat cells; whereas neural stem cells in the brain give rise to nerve cells; and epithelial stem cells in the lining of digestive tract give rise to absorptive cells and goblet cells (United States National Institutes of Health, 2009). Hematopoietic stem cells found in the bone marrow which is responsible for the formation of blood cells, is a good source of adult stem cells used in various clinical
treatments (Petersen et al., 1999; Lagasse et al., 2000). An important point is that unlike embryonic stem cells, AS cells generally only differentiate into the cells specific to their tissue of origin. However, recent findings have challenged this generalisation about adult stem cells limited differentiation (Clarke et al., 2000; Weissman, 2000). There are reports about adult stem cells plasticity to form specialised cells of other tissues (Wagers & Weissman, 2004). Plasticity refers to the ability of stem cells to mix with different cells. Since the process of harvesting adult stem cells does not involve destruction of embryos, ethical constraints do not arise.

On the other hand, induced pluripotent stem (iPS) cells are adult cells that have been genetically reprogrammed to an embryonic-stem cell state, and pluripotent in nature (Takahashi & Yamanaka, 2006). The first human iPS cells first reported in late 2007 (United States National Institutes of Health, 2009). In 2012, Shinya Yamanaka along with John Gurdon of Britain won the Nobel Prize for their discovery that mature adult cells in the body can be transformed back or reprogrammed into infant-state stem cells (AFP, 2012).

Embryonic stem (ES) cells, which is the focus of this study, are derived from embryos that develop from eggs which are fertilised in vitro. The fertilised egg divides and develops to form a blastocyst. The human embryonic stem (hES) cells are derived from a 4-5 day old blastocyst (embryo). The embryos are obtained from those donated from the left over infertility treatments. The blastocyst consists of trophoblast, blastocoels and inner cell mass. By transferring the inner cell mass of a blastocyst to a culture dish which allows the cells to divide, hES cells are cultured, which are pluripotent in nature. They can be differentiated into various cell types by scientists under ‘direct differentiation pathway’ (Wichterle, Lieberam, Porter, & Jessel, 2002).

Lastly, embryonic germ (EG) cells originate from the reproductive cells. They are derived from primordial germ cells found in a gonadal ridge (Donovan, 1998).
Human embryonic germ cells were first cultured in 1998 (Shamblott et al., 1998). They are isolated from the embryo or foetal tissue of 5-9 weeks old. The primordial germ cells are capable of differentiating into cells of multiple lineages (Donovan, 1998). The germ cells can develop into stem cells. However, the process involving destruction of embryonic or foetal tissue raises ethical constraints. Figure 1.1 shows how ES cells and EG cells are isolated respectively.

![Figure 1.1: Isolation of embryonic stem (ES) cells and embryonic germ (EG) cells](http://www.jnsbm.org/viewimage.asp?img=JNatScBiolMed_2010_1_1_43_71674_u3.jpg (Journal of Natural Science, Biology, and Medicine)

### 1.9.2 Sources of Human Embryonic Stem Cells

The discovery of human Embryonic Stem Cell (hESC) by the Wisconsin team in 1998 (Thomson et al., 1998) holds many promises in the medical frontier, especially in regenerative medicine. Human embryo is the developing stage between fertilisation until the eighth week of gestation, after which it is called foetus (United States National Institutes of Health, 2009).
The sources of human embryonic stem (hES) cells include:

(i) embryos created by *In Vitro Fertilisation* (IVF) for infertility treatments which are no longer needed, denoted as ‘surplus’ embryos (Dickens & Cook, 2007);

(ii) embryos created via IVF solely for research purpose (Lanzendorf et al., 2001), denoted as ‘research’ embryos; and

(iii) embryos produced from Somatic Cell Nuclear Transfer (SCNT) technique (Hochedlinger & Jaenisch, 2003)

This study focuses on source (i) and (ii) only.

First, we need to understand the acquisition of surplus embryos (also known as supernumerary embryos / spare embryos / excess embryos / superfluous embryos) for stem cell research. During infertility treatment, about seven to eight embryos will be produced in one cycle, whereby deformed embryos will be discarded, two or three will be transferred *in vivo* and the remaining will be cryopreserved (Dickens & Cook, 2007). The surplus embryos are obtained from the ‘frozen-thawed’ embryos (cryopreserved embryos) or ‘fresh’ embryos resulting from IVF cycles (Cohen et al., 2008).

There are special ethical concerns regarding the use of surplus fresh embryos. This includes the demographic and medical characteristics associated with a couple’s decision to donate surplus fresh embryos for research (Choudhary, Haimes, Herbert, Stojkovic, & Murdoch, 2004). Different countries have different legislation in allowing or restricting the use of fresh surplus embryos for stem cell research (Cohen et al., 2008). Likewise, there are also couples who oppose embryo freezing (cryopreservation) for cultural and religious reasons (Choudhary et al., 2004). The
availability of cryopreserved embryos for research has been reported in the United States (Hoffman et al., 2003), and Canada (Baylis, Beagan, Johnston, & Ram, 2003).

This study is only aimed at examining the ethical concerns of using surplus embryos for stem cell research as a whole. Couples who undergo IVF treatment would end up with surplus embryos which are no longer needed and they can either opt to discard the embryos, or donate to another couple or donate them for research purposes (Braverman et al., 2009). Consent needs to be obtained from couples who decide to donate the surplus embryos for research, and the donors should be informed of the nature of ES cell derivation (Braverman et al., 2009).

When research cannot be carried out on surplus embryos alone, embryos are then created via IVF from gametes donated by volunteers who have no reproductive intent. Human gametes that is, oocytes (egg cell) and sperms donated by anonymous donors are inseminated and cultured to form blastocyst, which is later extracted to produce human embryonic stem cell lines. These embryos created solely for stem cell research purposes are termed as research embryos.

Somatic cell nuclear transfer (SCNT) refers to the introduction of a nucleus from an adult donor cell into an enucleated oocyte (Wilmut et al., 2002). The cell will divide and develop. Stem cells are then extracted from the cells that develop into a blastocyst stage.

See Figure 1.2 on the isolation of stem cells through SCNT.
The procedure often termed as therapeutic cloning is for the purpose of generating ES cells for treatment and therapies. The SCNT technique can create clone for both therapeutic and reproductive purposes. In reproductive cloning, the blastocyst will be implanted into the woman’s uterus and it has the potential to grow. An example of SCNT employed for reproductive purpose is the cloning of Dolly, the sheep (Campbell, McWhir, Ritchie & Wilmut, 1996).

This study, however, only examines the ethics of utilising human embryos, created via in vitro fertilisation namely (i) ‘surplus embryos’, and (ii) ‘research embryos’.
1.9.3 The Science of Stem Cells

This section which deals with the biology and nature of stem cells, explains how stem cells are isolated and cultured in the lab. This section also looks into their pluripotent nature, which is why human embryonic stem (hES) cells are able to differentiate to various types of cells and tissues.

Thomson (2001) explains the Science behind embryology. After fertilisation, the zygote divides several times and the cells (blastomeres) of this cleavage–stage are undifferentiated forming a compact ball of cells known as the morula consisting of 32-128 cells which are totipotent in nature. Then, the cells continue to proliferate to form a blastocyst (Fischbach & Fischbach, 2004). The first differentiation occurs around five days of development at blastocyst stage consisting of an outer layer of cells (trophoblast) separating from the inner cell mass (ICM). The ICM cells have the potential to form any cell type in the body but do not have the trophectoderm layer to form the extraembryonic tissue required for implantation in the wall of the uterus (Fischbach & Fischbach, 2004; Thomson, 2001). See Figure 1.3 on stages after fertilisation until formation of blastocyst, and Figure 1.4 on how stem cells are isolated.

Figure 1.3: Stages after fertilisation until formation of blastocyst

In the intact embryo, ICM cells function as ‘precursor cells’ (Thomson, 2001). It is important to take note that ICM forms prior to implantation (Fischbach & Fischbach, 2004). It is only when these ICM cells are isolated from its embryonic environment and cultured under laboratory conditions, ICM-derived cells can proliferate and self-renew to form any cell type (Thomson, 2001). These ICM-derived cells that we refer to as Embryonic Stem (ES) cells are pluripotent in nature whereby they can differentiate into any cell types in the human body other than the extraembryonic tissue required for formation of placenta, and therefore they cannot form a whole human being (Fischbach & Fischbach, 2004). See Figure 1.5 on how the inner cell mass of a blastocyst differentiates into various types of tissues.
Human embryonic stem (hES) cells, which are pluripotent, have the ability to differentiate into a variety of specialised cells and tissues (Conley, Young, Trounson & Mollard, 2004). Most stem cells can only form certain differentiated progeny cells, but embryonic stem cells (ESC) have the potential to differentiate into all types of cells and tissues in the body which gives them the pluripotency (Okarma, 2001).

The pluripotent capabilities and ability to proliferate or self-renew under laboratory conditions make hES cells the best source of stem cells for research (Okarma, 2001). The hES cells are not embryos themselves, which means they cannot develop by themselves into a whole human (de Wert & Mummery, 2003; Okarma, 2001). Human embryonic stem (hES) cells are also immortal and malleable whereby
they are able to divide indefinitely and can be manipulated without losing their genetic structure and cell function (Holland, Lebacqz & Zoloth, 2001, *Introduction*, p. xviii).

The above mentioned properties explain why hES cells are preferred in comparison to the other sources of stem cells, which brings us to the core of this study, to study the ethical perspectives surrounding the use of human embryos to extract stem cells for research.

1.9.4 **Stem Cell Research in Malaysia**

The National Biotechnology Policy (NBP) launched by the then Prime Minister, Tun Abdullah Ahmad Badawi, in 2005 envisions biotechnology will be a leading economic engine of growth in Malaysia by the year 2020. The NBP is underpinned by nine thrusts, whereby Thrust 2 is related to healthcare biotechnology development. Malaysia is now in Phase II (2010-2015) of the NBP implementation (MABIC, 2015). Under Phase I (2005-2010) of NBP, the government has established BioTechCorp or Malaysian Biotechnology Corporation under the purview of Ministry of Science, Technology and Innovation (MOSTI), and also provided various tax incentives to biotechnology companies which are accorded the BioNexus status (BioTechCorp, 2014).

According to a post in Asia Medical Tourism, the Malaysia health care system is a leader in stem cell procedures, with two major cord-blood banks having more than 80,000 clients, both local and international (MyMedHoliday, 2013). The blood from a newborn baby’s umbilical cord is rich in stem cells. There are many affordable medical
centres and healthcare providers in Malaysia who are specialised in stem cell therapy and treatments (MyMedHoliday, 2014).

According to the report released by Academy of Sciences Malaysia (2013, p. 64), the companies offering stem cell therapy services are:

1. Nichi-Asia Centre for Stem Cells and Regenerative Medicine (NiSCELL), a Malaysian biotechnology company which has BioNexus status;
2. Stempeutics Research, which also has BioNexus status, and is part of Manipal Education & Medical Group;
3. Cytopeutics, which aims to bring stem cell treatment solutions to Malaysia and Asia Pacific;
4. CryoCord, the first in Southeast Asia to foray into isolation and processing of mesenchymal stem cells, and its facilities are ISO certified;
5. CellSafe International Group, with BioNexus status, which specialises in the preservation of cord blood stem cells;
6. Stem Life, the first stem cell banking and therapeutics company in Malaysia, which has BioNexus status and specialises in banking cord blood and peripheral blood stem cells;
7. EmCell, provides anti-ageing treatment with foetal stem cells; and
8. StemTech International, with BioNexus status, provides cord blood and adult stem cell banking, besides stem cell medical therapy

It was also reported that Stempeutics Research outperforms the universities in terms of productivity due to active collaboration and funding with the Ministry of Health (Academy of Sciences Malaysia, 2013, p. 13).

The report, however, does not state anything about the sources of embryos for stem cell research carried out by the companies in Malaysia.
Harun et al. (2006) confirms a much earlier engagement with hESC research, a collaboration between Stempeutics Research and scientists from Manipal Institute of Regenerative Medicine and Manipal Hospital in India. This is a multi-national project which involves the National Population and Family Development Board (LPPKN) under the purview of the Ministry of Women, Family and Community Development (Malaysia), the University of Sheffield (United Kingdom) and the Ferdowsi University of Mashhad (Iran). Another study by Stempeutics Research Malaysia with Manipal Institute of Regenerative Medicine and Manipal Hospital (India), was conducted on the propensity of hESC lines (Pal, Totey, Mamidi, Bhat, & Totey, 2009).

Among the many stem cell therapy providers in private medical centres in Malaysia are:

1. Gleneagles Medical Centre in Penang which offers stem cell therapies for blood disorders like leukemia, lymphoma, myeloma, sickle cell anemia and thalassaemia;
2. Kuala Lumpur Sports Medicine Centre which provides cartilage regeneration with peripheral mobilised stem cells;
3. Tropicana Medical Centre in Kuala Lumpur, collaborates with StemTech International to provide stem cell banking and therapy services;
4. Sime Darby Healthcare in Subang Jaya which offers bone marrow transplantation;
5. International Specialist Eye Centre which offers stem cell treatment for cornea deficiencies;
6. Penang Adventist Hospital which collaborates with Cytopeutics and Stempeutics to offer stem cells for intractable heart failure cases

(Academy of Sciences Malaysia, 2013, p. 65)
Again, it is to be noted that the report did not disclose information about the stem cell providers in the public hospitals.

The Institute for Medical Research (IMR) in Kuala Lumpur is the research arm of the Malaysian Ministry of Health. Stem cell transplants in Malaysia are usually carried out for patients suffering from leukemia and thalassaemia, and as of November 2013, more than 500 stem cell transplants have been carried out (Institute for Medical Research, 2013). Foong (2012a) reported that hESC lines were derived from surplus embryos from Metro IVF fertility clinic to establish the Malaysian stem cell line under the collaboration of IMR with a public hospital in Klang and Stempeutics Research.

Gan et al. (2008) reviewed about stem cell transplantations sourced from bone marrow, indicating collaboration between the major public and private hospitals which include University Malaya Medical Centre, Subang Jaya @ Sime Darby Medical Centre, National University Hospital, Ampang Hospital and Institute of Paediatrics in Kuala Lumpur.

Loke et al. (2010) reported that only haematopoietic stem cell therapy is established with a registry. Haematopoietic commonly refers to bone marrow. Other modalities of stem cell therapy considered experimental, and conducted under the aegis of National Stem Cell Research and Ethics Sub-Committee (NSCRES), adhere to *Malaysian Guidelines for Stem Cell Research and Therapy*, which requires therapeutic outcomes to be reported back to NSCRES. Hence, stem cell therapy providers from private sector collaborated with the Clinical Research Centre (CRC) of the Malaysian Ministry of Health (MOH) to set up the National Stem Cell Therapy Patient Registry. The purpose of the registry is to gather long-term data on the efficacy and adverse outcomes of stem cell therapy from other modalities (Loke et al., 2010).

On 29th and 30th October 2012, Malaysia held its first National Stem Cell Congress at Kuala Lumpur, a joint collaboration between the Ministry of Health (MOH)
and National University of Malaysia Medical Molecular Biology Institute. The National Committee on Ethics of Stem Cell Research and Therapy (NCESRT) under the purview of MOH acts as the review committee for research proposals. During the congress, it was reported that most of the stem cell research work has involved haematopoietic stem cells (bone marrow, peripheral blood, cord blood), and among the projects completed in the Institute for Medical Research (IMR) approved by the MOH are propagation, expansion and derivation of human embryonic stem cell (hESC) lines (MOH, 2012). The National Stem Cell Coordinating Centre set up in March 2014 has the database of all the registered donors whether peripheral blood, bone marrow or umbilical cord blood, and provides information about suitable donors to clinical transplant experts (Aruna, 2014). However, information on embryonic stem cells was not disclosed.

Other conferences and workshops on stem cell research carried out in the past in Malaysia include: - Adult Stem Cell Workshop in October 2003; 2nd National Tissue Engineering and Regenerative Medicine Scientific Meeting in 2008; Cell based Therapy Workshop in July 2008; Seminar on Advances in Stem Cell Therapy in December 2009; 3rd National Tissue Engineering and Regenerative Medicine Scientific Meeting in Regenerative Medicine Scientific Meeting in October 2010; and Annual International Conference on Stem Cell Research in April 2011 (Academy of Sciences Malaysia, 2013).

There are 110 researchers who are playing an active role in stem cell research from both the public and private institutions of higher learning, with the National University of Malaysia dominating the field, followed by Putra University Malaysia and University of Malaya (Academy of Sciences Malaysia, 2013). This was also confirmed in my personal communication with a medical officer from the National Population and Family Development Board (LPPKN) in May 2011, who stated that the National
University of Malaysia and University of Malaya are actively doing research on stem cells\(^6\).

During the Stem Cell Research and Therapy Seminar at Ampang Hospital in August 2009, the then Minister of Health, Dato’ Seri Dr. Liow Tiong Lai said that Malaysia is as advanced as other countries in this field, and RM32 million was allocated for over five years to develop stem cell and cord blood banking activities in the country (MOH, 2009b). The local sources which provide funding for stem cell research include the Ministry of Education providing grants for universities and institutes of higher learning, Malaysian Biotechnology Corporation, Ministry of Science, Technology and Innovation, and Malaysian Technology Development Corporation (Academy of Sciences Malaysia, 2013).

Research on stem cells in Malaysia is presently not covered by any legislation. Provision of stem cell therapy services by health providers is not restricted, but subjected to the regulations provided by the Private Healthcare Facilities and Services Act [1998, Act 586] (Academy of Sciences Malaysia, 2013).

However, the Ministry of Health came out with a set of guidelines in 2009 covering stem cell therapy called the Malaysian *Guidelines for Stem Cell Research and Therapy* (MOH, 2009a) (refer Appendix A). Issues like the use of surplus embryos are referred to the decision of the Malaysian Fatwa Council dated 22nd February 2005 on its 67\(^{th}\) sitting (Department of Islamic Development Malaysia, 2005) (refer Appendix B). *Fatwas* are formulated by religious scholars and authorities in Islamic jurisprudence after a process of ethical reasoning. Accordingly, frozen surplus embryos from IVF trials may be allowed to be used for research if parents consent; however the creation of human embryos solely for research by any means including Assisted Reproductive Technology (i.e. IVF) or through Somatic Cell Nuclear Transfer (SCNT) is prohibited.

\(^6\) Personal communication through e-mail with Dr. Rosliah Harun from LPPKN in May 2011.
To recap, in Malaysia, IVF trial attempts were first carried out in 1984 (Nor, 1999) followed by a live birth three years later in 1987. A private medical centre in Malaysia recently announced the birth of its 3000\textsuperscript{th} IVF baby (Ong, 2012). It is the largest number attributed to a single medical centre in Malaysia (refer Appendix C), with a clinical pregnancy rate\textsuperscript{7} of 62.1\% of the total IVF trials performed in the year 2011 alone (TMC Fertility Centre, 2014). However, to the best of my knowledge, the national record on the fate of those surplus embryos produced in the IVF cycles nationwide is not available. The surplus embryos produced abundantly from the expanding use of IVF trials in Malaysia, would most probably end up in the trash if those embryos are not donated for ESCR.

This researcher faced difficulty in accessing the national records and statistics about the source of human embryos used in stem cell research and how they are retrieved for research. What we know from the websites of the private medical centres in Malaysia providing IVF trials is that while the best embryos are chosen for embryo transfer, the surplus good quality embryos are frozen for future use (Metro IVF, 2011; KL Fertility Centre, 2014; Sunfert IVF, 2013). It is for this reason that those IVF couples who no longer wish to freeze the surplus embryos may consider donating them for ESCR in Malaysia.

On that note, this study will be looking into the ethical perception of the local religious leaders pertaining to the utilisation of both the surplus and research embryos in ESCR.

\textsuperscript{7} Clinical pregnancy rate is defined as a pregnancy where an ultrasound scan has shown at least one fetal heartbeat as defined in http://www.tmcfertility.com/our-success-rates.
1.9.5 Worldwide Policies on Embryonic Stem Cell Research

Many countries worldwide have reviewed policies on embryonic stem cell research.

Walters (2004, p. 3) identifies six policy options pertaining to ESCR adopted by nations around the world:

Option 1: No human embryo research is permitted
Option 2: Research permitted on existing hESC lines
Option 3: Research permitted on surplus embryos
Option 4: Research permitted on surplus embryos and research embryos created via IVF
Option 5: Research permitted on surplus embryos and research embryos created through SCNT
Option 6: Research permitted on surplus embryos and embryos created through transfer of human somatic cell into non-human animal eggs

The focus of this study is on Option 3 and 4.

First, let us review the policies in Europe and America. In the United States, the policy regarding ESCR is politically-driven and varies from state to state. It can be described as a ‘patchwork of diverse policies at state level’ with a unified policy on funding of ESCR at federal level (Walters, 2004). As announced by the then President Bush on August 9, 2001, federal funding is permitted for research using stem cells from existing stem cells lines, as identified by the National Institutes of Health, which are derived from surplus embryos prior to the announcement date (United States National Research Council Report, 2001). Thus, Walters (2004) has categorised that President
Bush’s endorsed Option 2 from his list. The policies of individual states, however, seem to differ from one another, where some allow the use of surplus embryos and research embryos while a few states ban these, opening a broad approach between Option 2 to 6. The United States, thus, lacks coordinated national monitoring, oversight or regulatory system. Years later, President Obama’s administration has taken a moderate position that allows research and funding on derivation of stem cells from surplus embryos which otherwise would be discarded, expanding hESC lines which are eligible for federal funding and improving oversight (Streiffer, 2009).

In contrast, Germany, restrictive in manner, completely prohibits derivation and use of embryonic stem cells for research. Centred on the *Embryo Protection Act of 1990*, any human intervention on human embryos is prohibited (Germany Federal Law Gazette, 1990). According to the act, those caught for improper use of human embryos which include developing embryos for any purpose other than pregnancy are liable for punishment. Under the *2002 Stem Cell Act*, the importation of embryonic stem (ES) cell lines into Germany is permitted under strict conditions, but the imported ES cell lines must be derived before the cut-off date of 1 January 2002 (EuroStemCell, 2012a). In his analysis, Walters (2004) stated that Germany adopts Option 2 from the six policy options, with a time limit, whereby it permits importation and use of existing human embryonic stem cell lines, which were derived outside Germany before 2002. Then, in 2008, the German parliament made amendments to the *Stem Cell Act*, to move the cut-off date for importation of human embryonic stem cell lines from 1st January 2002 to 1st May 2007 (EuroStemCell, 2012b).

It is interesting to note that the chosen point in Canadian law is not human embryo per se, but the benefits of human health and dignity, and considerations to protect the health of its citizens and to prevent commercial exploitation (United States President’s Council on Bioethics, 2002). According to regulations under *Assisted
*Human Reproduction Act 2004*, surplus embryos may be used for stem cell research, but producing *in vitro* research embryos is prohibited (Government of Canada, 2004). Thus, Walters recognises that Canada has formally endorsed Option 3 from his list.

United Kingdom has taken a permissive approach in allowing the derivation of stem cells from surplus embryos, and research embryos, created via IVF and SCNT, which are no older than fourteen days. Thus, Walters (2004), states that the United Kingdom adopts option 4 and 5. The *Human Fertilisation and Embryology Act 1990* under the Human Fertilisation and Embryology Authority (HFEA) - regulates infertility treatment, storage of gametes and embryos, and embryo research, for both public and private funded activities (HFEA, 2012). Research on human embryos is also outlined in the subsequent *Human Fertilisation and Embryology (Research Purposes) Regulation 2001*, whereby the use of embryos in stem cell research can be carried out subject to HFEA (EuroStemCell, 2012c). The broad research projects licensed by HFEA between 1<sup>st</sup> April 2012 until 31<sup>st</sup> March 2013, include development of human embryonic stem lines at the Centre for Stem Cell Biology and Section of Reproductive and Developmental Medicine; derivation of human embryonic stem cell lines from research embryos and abnormal surplus embryos at Manchester Fertility Services Ltd, St Mary’s Hospital and University of Manchester; derivation of human embryonic stem cells at Roslin Cells Limited; and derivation of stem cells from surplus embryos at University of Cambridge (HFEA, 2013). The United Kingdom has a comprehensive regulatory framework for stem cell research (EuroStemCell, 2012c).

In Asia-Pacific, Walters (2004) recognises that Australia adopts Option 3, with a time limit, that research is only allowed on surplus embryos. Under the provisions of the revised Research Involving Human Embryos Act 2003, the offences are clearly outlined in Part 2, Division 1 on ‘Regulations of the use of excess assisted reproductive
technology embryos, other embryos and human eggs’ (Government of South Australia, 2012).

Among the Asian countries, China, has adopted a liberal policy, with India and Singapore moving to that direction. The Chinese government allows research on human embryos and cloning for therapeutic purposes. In December 2003, the *Ethical Guidelines for Research on Human Embryonic Stem Cells* was enacted by the Ministry of Science and Technology, and Ministry of Health of China. Accordingly, human reproductive cloning is prohibited, but stem cells can be derived from surplus embryos, germ cells, and research embryos created from somatic cell nuclear transfer (SNCT) technique (Chinese National Human Genome Centre, 2004; Liao, Li & Zhao, 2007). The dynamism of the country’s policy was reviewed by Liao, Li and Zhao in 2007 who stated that China prohibits hybridising human germ cells with germ cell of other species. As such, I would safely say that China adopts Option 5, although Walters (2004) at the time he wrote his article, recognised China as adopting Option 6.

Another country in Asia, that is embodied by religious beliefs and values, which has also shown a significant interest in the field of stem cell research is India. In line with the new developments in stem cell research, in December 2013, the Indian Council of Medical Research (ICMR) under the Department of Health Research and Department of Biotechnology, revised its previous *Guidelines for Stem Cell Research and Therapy* issued in 2007, naming it in 2013 as *National Guidelines for Stem Cell Research*. The major difference is omitting the word ‘therapy’ from the title of the guidelines, as ICMR wishes to emphasise that stem cells are still not part of standard care, until its efficacy in therapy is proven. As such, the guidelines only cover stem cell research (Indian Council of Medical Research, 2013). This was also reported in the nation’s leading daily, that any use of stem cells in patients will be considered research and not therapy, and it must be done under approved and monitored clinical trial to prevent
malpractice (The Hindu, 2014). According to the new guidelines, the permitted areas of research are in vitro studies on pluripotent stem cell lines, that is embryonic stem (ES) or induced pluripotent stem (iPS) cells and adult stem cells. The restricted areas of research include creation of a human zygote through IVF or SCNT or any other technique. However, the proposed research cannot be carried out with existing ES cell lines or those derived from surplus embryos. Research related to human germ line gene therapy and reproductive cloning is prohibited (Indian Council of Medical Research, 2013). Walters (2004) recognised that India has adopted Option 3 from his list. However, the same cannot be said about the new guidelines in 2013, as it appears that India is taking a cautious step in reviewing its policy.

Singapore, a multi-racial and multi-religious nation, is one of the countries in the Asian region which is intensively carrying out stem cell research. In 2003, Singapore launched Biopolis, a world-class research complex recruiting researchers from around the world (Biomed-Singapore, 2004). Stem cell world-expert, Dr Alan Colman, who was in Dolly cloning team, came to Singapore to spearhead projects of ES Cell International, to translate human embryonic stem cells into therapeutic potentials (Biomed-Singapore, 2005). Singapore’s climate and stable funding attracts stem cell scientists from around the globe (Bloomberg, 2005; The New York Times, 2006;). Walters (2004) recognises Singapore as adopting Option 4 and 5 from his list, that research is permitted both on surplus embryos and research embryos created via IVF or SCNT.

The Singapore Bioethics Advisory Committee (BAC) had sought the viewpoints of various institutions and also religious councils, when deriving the report Ethical, Legal and Social Issues in Human Stem Cell Research, Reproductive and Therapeutic Cloning in 2002. The National Council of Churches of Singapore, the Catholic Medical Guild of Singapore, the Sikh Advisory Committee and the Singapore Hospital
Association believe that human life begins at conception, whereas the Islamic Religious Council (Majlis Ugama Islam) of Singapore contends that human life only begins after ensoulment\(^8\) around the fourth month of conception. The Singapore Buddhist Federation supports research on ‘non-sentient pre-implantation human embryos’ for the benefit of mankind.

The Singapore BAC (2002) took careful considerations of the diverse views not only from the religious community, but also from the medical, legal, and scientific community and members from the international panel of experts. The Singapore BAC adopted the intermediate position that the human embryo has a special status acknowledging its potentiality to be a human being, but it does not have the same status as a living child or adult. The Singapore BAC supports ESCR as having potential benefits, but stated that research is allowed on embryos which are less than 14 days old.

According to the report by Singapore Bioethics Advisory Committee (BAC), embryonic stem cells can be derived from surplus embryos rather than allowing those embryos to perish, in view of greater good. In addition, acknowledging the need to balance between respecting embryo and potential benefits of ESCR, the Singapore BAC stated that the creation of research embryos (solely for research purposes) can only be justified when there is strong scientific merit and potential medical benefits with no other alternatives and on a highly selective case-by-case basis approved by the statutory body (Singapore BAC, 2002, pp. iii - vii, 26-30)

Singapore has provided a model study in conducting extensive consultations with various research groups and religious authorities on their standpoints on ESCR. It is noteworthy that Malaysia, which has similar cultural, demographic and religious make-up, has not come out with a report comprising views of all religious councils on ESCR. No similar study in the context of Malaysia has been carried out so far, and that is why this study explores the views of Buddhists, Hindus and Catholics on ESCR.

\(^8\) Ensoulment is inception of soul into a human being, marking presence of life
Malaysia’s current *Guidelines on Stem Cell Research and Therapy* based on fatwa ruling (MOH, 2009a), takes the middle-way approach that allows the use of surplus embryos for ESCR, but prohibits generation of research embryos for research.

Precisely, the progress of ESCR, the advances of scientific knowledge and research activities and oversight for regulations are dependent on public and private funding, which are very much influenced by the county’s political and religious landscape. This explains why policies on ESCR vary according to countries and sources of embryos.

Hoffman, the founder of the Minnesota Biomedical and Bioscience Network, who has been following and mapping world stem cell policies for over six years, and reporting in *The Hastings Centre*, has come up with a map on International Stem Cell Policies in 2009, revising his previous 2003 map as shown in Figure 1.6.

![Figure 1.6: Stem cell world policy map 2009](http://www.thehastingscenter.org/uploadedImages/Bioethics_Forum/2009map.jpg)

*Source:*


Hoffman came up with the map to reflect national policies as well as to review whether surplus embryos donated from IVF clinics can be used in ESCR. The map and explanation below is based on the information given in the Minnesota Biomedical and
Bioscience Network. Accordingly, dark brown denotes various techniques allowed, in countries like Australia, India, Singapore and China, which is reckoned as having permissive policy (Hoffman, 2009). Then, the light brown denotes that research is only allowed on surplus embryos derived from fertility clinic donations, in countries like Brazil, South Africa, Canada, Thailand, Russia and France, reckoned as having flexible policy (Hoffman, 2009). The grey shade denotes restrictive policy in countries like Ireland, Italy, Norway, Poland and Germany, and the yellow colour for countries which have not established any policy (Hoffman, 2009).

In this 2009 map, Malaysia, is shaded in yellow, but I am of the view that this certainly would have changed with the release of the *Malaysian Guidelines on Stem Cell Research and Therapy* in July 2009. There is no updated map on stem cell policy revising this 2009 map by Hoffman; however, I believe policies of all the nations would have been subjected to reviews and changes in the last five years since 2009 and therefore this map should be treated cautiously as it may not fully represent today’s development in stem cell policies.

By and large, the policies in Malaysia are formulated taking into account the opinions of the religious community. Therefore, this study on the ethical perception of the religious representatives pertaining to ESCR is imperative.

### 1.10 Organisation of study

Chapter 1 provides an overview of this study. The statement of problem, objectives, research questions, and significance of this study are discussed. The research methodology is briefly discussed. Scope and limitations of the study is also delineated. This is followed by an overview on the scientific aspect of stem cell research (SCR). This chapter also provides insights on the sources of embryonic stem
cell research (ESCR) which include surplus and research embryos, worldwide policies and Malaysian guidelines related to ESCR.

Chapter 2 concentrates on the review of literature in two parts; first on ethical considerations and then on religious considerations. In the first part, related research and studies by scholars who have explored the subject on moral status of embryo is examined. This is followed by a review of religious considerations on ESCR. Both local and international Islamic works highlighting the position of Islamic community on ESCR are examined. The perspective of other main religions on ESCR is also examined, though the available literature is limited. This is followed by a summary of the significant literature presented in the form of a table. Finally, a critical evaluation of the literature which concurs with the statement of problem is presented, addressing the need to study the ethics of ESCR from the perspectives of the Buddhist, Hindu and Catholic leaders in Malaysia. A conceptual framework formulated based on the literature review is presented at the end of the chapter, which delineates the direction of this study.

Chapter 3 describes the methodology employed for this research - qualitative study with purposive sampling. The justification for employing a qualitative study concentrating on semi-structured interviews is given. The chapter also looks into why interviews were chosen over survey to study the perspectives of respondents for a contentious issue like ESCR. The interview guide which is closely aligned with the objectives and framework of the study, is presented. Criteria for choosing the sample size, and respondents who are ‘information-rich’, are discussed. This chapter also presents the profiles of the interviewees who were selected for this study. The method of analysis, that is thematic analysis, is also discussed.
Chapter 4 is dedicated to provide empirical evidence and research findings based on the analysis of data. This chapter begins by explaining how the themes were derived. This is followed by the analysis tables in assigning the themes. For every identified theme, a thematic map summarising the analysis table is presented, followed by analysis of the findings in descriptive form. The ethical concerns of the respondents, denoted as ‘theme’ are explored from various perspectives and supported with verbatim quotes from the interviews. The findings aim to address the first objective and partly the second objective of this study.

Chapter 5 brings to central discussion of the findings. Ethics of ESCR according to fundamental beliefs of the Buddhist, Hindu and Catholic tradition, interwoven with key findings are presented. This is followed by an overview analysis on the multitude viewpoints of the major faiths on ESCR, in which the commonalities and differences among the faiths are discussed according to the identified three themes.

Chapter 6 presents empirical findings and further discussion on the standpoints of the respondents with regards to the use of surplus and research embryos, alongside with literature on the acceptability of ESCR for both the sources. Finally, the recommendations of the respondents and their openness for a general consensus are explored, alongside with literature outlining the challenges for a consensus. This chapter aims to address the second and third objectives of this study.

Chapter 7 concludes the study by drawing a correlation between the findings and the objectives and research questions of the study. The findings are then incorporated in the conceptual framework. The chapter ends with implications of study, concluding remark, recommendations, and suggestions for future research.
CHAPTER 2: LITERATURE REVIEW

The literature review is divided into two parts:

2.1 Ethical Considerations – moral status of embryo that is on moral respect of early life; sentience, personhood and potentiality of embryo; and moral questions over the use of surplus and research embryos

2.2 Religious Considerations – summary on ESCR from the Islamic, Buddhist, Hindu and Catholic standpoints

This literature review explores and analyses the literature for the past 30 years but the focus is on the literature in the last 15 years published after the announcement on the isolation of stem cells by Thomson et al. (1998). Thereafter, is a summary table on significant review of literature. Section 2.3 presents my evaluation of the literature, and how this study comes in, contributing towards knowledge building in this field. A conceptual framework follows at the end of the chapter in 2.4
2.1 Ethical Considerations

This section looks into the ethical considerations of ESCR, which mainly revolves around the moral status of embryo, which is further examined from the aspect of (i) moral respect for early life, and (ii) sentience, personhood and potentiality of early embryos. Then the morality of ESCR in light of the use of surplus and research embryos is examined.

2.1.1 Moral Status of Embryo

It is inevitable that the derivation of stem cells from human embryos in ESCR, entails the destruction of those embryos. The morality of ESCR very much depends on the morality of destroying embryo, thus raising questions about the moral status of human embryo (Steinbock, 2006).

Moral status is attributed by moral agents to entities, by virtue of which it morally matters for the entities’ sake. Thus, it gives rise to moral obligations towards the entities. We, human beings as moral agents, have moral obligations to those entities i.e. human embryos.

A human embryo is a member in the earliest stage of the Homo sapiens species, but does this mean the human embryo deserves full moral respect as that of a human being? This leads us to the question when does human life begin. To those who view that human life begins at conception, then that is taken as an indication to mark the moral status of a human being.

The ethical debate surrounding ESCR very much depends on the answer to the question: what is an embryo? If the embryo is regarded as a human being, then the treatment towards the embryo would be the same as that accorded to human beings. On
the other hand, if the embryo is regarded as nothing more than a clump of cells, then there would be less restriction to employ them in research (UNESCO IBC, 2001).

The morality of ESCR is often associated with the morality of abortion although each is distinctly different, and has its own ethical conundrums. Taking abortion as an example to discuss the moral status ascribed to human beings, Warren (1997) has categorised three classes of thoughts; conservative, moderate and liberal. The conservatives maintain that from the moment an ovum is fertilised, the conceptus is given the status of a human being, while the liberals argue that only at birth or some point after birth that one gains right to life. The moderates argue that a foetus does not have full right to life until it has attained some significant development (Warren, 1997).

Although issues revolving around ESCR cannot be compared to abortion, the three approaches - conservative, moderate or liberal - can be applied to discuss issues related to ESCR as well. Based upon religious convictions, some believe that human life begins at conception, and therefore a human embryo is a human person which has the same moral status as an adult or a living child (Lo & Parham, 2009). For argumentative purpose, I call this the ‘conservative’ view. There is also a view that embryo becomes a person in a ‘moral sense’ at a later stage of development (Lo & Parham, 2009). That implies the early embryonic life lacks moral status, and that moral status increases with degrees of development. I would call this as the ‘moderate’ view. Others, however, believe that the embryo or blastocyst is just a group of cells, and it is alright to utilise them for research. While acknowledging that these embryos deserve special status as a potential human being, it is permissible to use them in research for progress of science and morally good reasoning (Lo & Parham, 2009). I would call this the ‘liberal’ view.

According to a report by UNESCO IBC (2001), embryonic stem cell research raises ethical concerns giving rise to opposing principal positions, either (i) the use of
human embryos for deriving embryonic stem cells is ‘intrinsically unethical’, that is to ‘instrumentalise human life’ and to weaken the respect to those vulnerable, such as human embryos [I call this the conservative view], or (ii) a position that holds use of embryonic stem cells is ethically acceptable for medical purposes, because the embryo does not entail the respect and protection which goes with personhood⁹ [I refer to this as liberal view]

Going with the latter position that ESCR is justifiable for medical benefits, Hug (2006) has raised the question as to whether the moral status needs to be compromised for therapeutic perspectives of human ESCR. Henceforth, Hug (2006) listed down the varying positions on the moral status of human embryo, which are human embryos (i) have full moral status from fertilisation and are worthy of protection, or (ii) gain moral status and protection gradually, or (iii) have no moral status, and no different from any other body parts. Hug concluded that the varying interpretations show that there is no general consensus on the moral status of embryo.

Tilting towards the conservative view, George and Gómez-Lobo (2005) disagree that an early embryo is only an intermediate form which later emerges into a whole human organism. They maintain that the development from zygote stage onwards is directed from within itself. Now, this brings us to the question as to whether the human embryo is a human being deserving full moral respect. To that, George and Gómez-Lobo (2005, p. 205) state that since human beings are intrinsically valuable deserving full moral respect, it follows the same way from the point they come into a being. That also includes early embryonic live coming into existence from fusion of gametes, and as such they should be accorded the full moral status and respect ascribed to inviolability of any other human beings. According to George and Gómez-Lobo (2005, pp. 201 - 203), we distinctively were ‘whole, living members’ of Homo sapiens at embryonic stage and the combination of maternal chromosomes of the egg and paternal

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⁹ Personhood is defined as the status of being a person. More discussion in Section 2.1.1.2
chromosomes of the sperm signifies the existence of new, distinct organism. Although the timing of the early cleavages is controlled by maternal RNA within embryo, they argue that the cleavages would not have occurred without the presence of the nuclear gene and therefore the direction of the embryonic growth relies on the genetic information in it. The embryo is a living organism as the major development is controlled and directed from within itself and it is unlike gametes, as it is ‘not part of the mother or father anymore’, it is actually a new living being.

Here, are we referring to biological development or genetic development? A new human life begins from the union of the sperm and ovum. However, according to Green (2002, part III, p. 21), biologically for us to accept the existence of a human life the forty-six chromosomes [omitting abnormalities] from the father and mother have to work together but at the early stages of human development, the zygote is controlled by the maternal RNA. Therefore, how can we be assured that the life of a new human being has already started at a point when the ovum is fertilised? Green (p.21) further questions as to when we can determine that fertilisation has occurred – is it after the genetic material from the sperm penetrates the egg’s outer membrane (zona pellucida), resulting ‘signals pass to zona that renders it impenetrable by other sperms’? Green also points out that it is only correct to say that human cell exists when the forty-six chromosomes work together, but this is not the case during the first few cell divisions whereby the earliest development structure is ‘governed by the egg structure and maternal chromosomes’. In his paper, Green (2002) argues that a biological occurrence such as fertilisation is a process rather than an event and therefore the determination of significant point within these processes involve choice on our part.

On that note, Orr agrees with Green that fertilisation is not an event, but a process that consists of subprocesses (Orr, 2002). However, Orr disagrees with Green on the point that ‘the beginning of life is at the end of the beginning of the processes’.
Orr (2002, p.58) goes on to claim that ‘the beginning of life is at the beginning of the beginning of the process’. Therefore, the process is inherent, not imputed. In other words, the moral status of embryo is also inherent and that fertilisation clearly marks the start of moral status.

If fertilisation marks the start of moral status, does the embryonic life warrant inviolability? To this, Gomez-Lobo (2004) writes, “…if I claim inviolability for myself now, it would be irrational not to claim it for previous stages of my existence, all the way back to my inception” (p.79).

DeGrazia (2007, pp. 299-300) says that inviolability here refers to moral respect, and therefore he says that those words are more of an appeal for the ‘necessity of early moral protection’. One cannot resolve the issue as to whether early embryo has moral status by referring to present status of inviolability in a simple reductionist manner, because the present entitlement not to be killed does not entail past entitlement in the same manner.

Along the same line, McMahan (2002, p.4) states that the fact that ‘something living and human being begins to exist around the time of conception does not follow that we began to exist at conception’. Now, does this imply that the 5-day old human embryo lacks moral status?

Another contentious point about the cells of early human embryo is the distinction between the ontological status (nature of existence) of the human embryonic stem (hES) cells with that of an embryo (de Wert & Mummery, 2003). They argue that if one regards (hES) cells derived from inner cell mass (ICM) of a blastocyst as embryos, then we should also regard somatic cells which have potential to develop as embryos via cloning technology as embryos too – and that would be absurd to think that somatic cells are potential persons. Resonating to this, is the argument that ‘mere
species membership’ cannot confer moral status on an embryo at blastocyst stage which lacks the properties of a rational agent (Brock, 2006).

At this juncture, if we were to say human beings have full moral status, in the first place, how could one reason out what confers that moral status on us? (DeGrazia, 2007). In other words, how can we be assured that we human beings are entitled to full moral status? Though one would go back to the religious texts that state Man is given special status on Earth, it is difficult to link Homo sapiens and full moral status (DeGrazia, 2007). The question remains that if embryos have full moral status, then research that entails its destruction is impermissible (DeGrazia, 2007). Here, again we are faced with the question whether destruction of early embryos is tantamount to killing.

Another pressing issue, is the association made between ESCR and abortion, because of the concerns over the manipulation and destruction of early ‘life’. The proponents of pro-life are against destruction of life in any form.

It is important to note that abortion involves aborting foetus (a development after embryonic stage) by choice whereas ESCR involves destroying early stage embryos of 4-5 days old, and to a great degree is less of a moral concern for it focuses on harvesting cells for therapeutic uses. As much as abortion seems to be synchronised with ESCR, there are many factors that distinguish both.

Hanson (2006) argues that a position against abortion does not necessarily lead towards ESCR rejection. The difference in potentiality between the embryos utilised in ESCR and the embryos discussed in abortion debate - could allow ESCR even if one argues that abortion is impermissible, based on the moral distinction between in vitro embryos and embryos (or foetuses) in the womb.

Davis (2002) highlights that the stem cells are derived from embryos which have never been and will never be in a woman’s body. Davis stated, “The fears that prompt
people to oppose abortion and reproductive cloning are not necessarily relevant to stem cell research” (p.48)

Along this line, it is worth noting that there are pro-life activists who strongly oppose to induced abortion who have accepted ESCR. One fine example is the announcement of Senator Orrin Hatch, who is a pro-life activist himself in the United States. Hatch (2002) in his senate website stated, “The support of embryonic stem cell research is consistent with pro-life, pro-family values…I believe that human life begins in the womb, not a petri dish or refrigerator …”

The logic behind this kind of argument is that the personhood of an embryo depends upon the location and method of fertilisation. However, countering this argument is that all human embryos are human beings, regardless of the method of procreation.

Those who are against abortion generally have made two assumptions; (1) Human beings exist at conception, (2) Human beings have full moral status beginning from zygote stage onwards (DeGrazia, 2007, p.297).

This again brings us to question the moral status of an embryo. If human embryo has moral status, then the research that entails its destruction is unethical.

Debates on the moral status of embryo in legal ruling often refers to the United States (US) Supreme Court decision in 1973, Roe v. Wade, 410 US 113(1973), which legalised abortion for the first two trimesters of pregnancy. Pregnancy is divided into three trimesters. Each trimester corresponds to the development of the human embryo. This is the first case in which the US Supreme Court dealt specifically with the legal status of embryo, and to determine whether the embryo (or foetus) to be aborted was a ‘person’ or not. This court ruling protected women’s right to abortion through the point of foetal viability, i.e. the ability of the foetus to survive outside the uterus. The court

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10 For a copy of detailed court decision, see Newton 2007, p. 72-74, 222-223
ruling concluded that the chances of survival of an embryo outside the uterus during first trimester are so small, that it could not be legally considered to be a ‘person’.

How does this ruling on abortion, have a bearing on ESCR? Extracting stem cells from inner cell mass of blastocyst entails the destruction of embryos, which lead us to question the moral status of the embryo itself. With respect to ESCR, the court ruling did not resolve the question as to when life begins. If it is legally right to abort the embryo for the first two trimesters of pregnancy, then would it be also ethical to conduct ESCR with 4-5 day old embryos? This is what researchers want to know and compelled to question when human life begins. Thus, the Roe v. Wade case has only a ‘modest impact’ on the morality of ESCR (Newton, 2007).

The interpretations on moral status of embryo, however, vary according to geographical, cultural and demographic factors. This study seeks to explore the issue from the religious aspect of Malaysia.

In the next section, literature on the moral status of embryo is examined further from the aspect of moral respect for early life; and sentience, personhood and potentiality of embryo.

### 2.1.1.1 Moral Respect for Early Life

To study the morality of ESCR, we need to know the moral status of a 5-day old embryo. For that, first, we need to know when life begins and worthy of respect. Fischbach and Fischbach (2004, p.1369) argue the claim that life begins at conception is an easy way-out relying on the assumption on the ‘value of potential of life’. But it is not the best way to describe beginning of life as ‘value is placed on function rather than structure’. They also pointed out that implantation of embryo in the uterine wall marks
the beginning of life, and the point when the nervous system starts to form whereby sensation exists indicates the presence of life (Fischbach & Fischbach, 2004).

To regard five-day old embryos as having life would mean that the destruction of those embryos in ESCR would be viewed as killing. As to whether harvesting stem cells from blastocyst is tantamount to killing a human being, Sandel (2004) asserts that because every person began life as embryo does not prove that embryos are persons, as human life develops by degrees. Sandel quoted the example of ‘oak trees were once acorns’ does not show that acorns are oak trees. Whether we can make comparison between an embryo and an acorn is a question itself.

The often-laid arguments are that human embryos are not full human person, and are not human beings worthy of human respect because, they have a high mortality rate, and high chances of being spontaneously aborted.

According to Sandel (2004), viewing embryos as persons will rule out not only ESCR but also all other fertility treatments that use embryos. This very much tells that the embryos in the laboratory are not entitled to the same moral respect as to how we perceive an embryo implanted in a woman’s uterus. Supporting this view, is the argument that an early human embryo prior to implantation does not have the same moral status as a human person because it lacks morally relevant capacities (Hall, 2004). In addition to that, Sandel (2004) also pointed out to the work of ‘nature’ whereby a high percentage of embryos spontaneously abort due to failure of implantation. This is seen as a reason for not according early embryos the same moral status as that of the embryos at later development stages (Hall, 2004). This is in line with the gradual view that the moral status of embryo increases with stages of development in life (Hug, 2006). However, the argument against this view is that if we were to regard the moral status of embryo according to its biological development, then it would be like making arbitrary decisions about what a human embryo is.
Along the same line, McGee and Caplan (1999) who explored the characters of the cells in the petri dish noted that it is “not always possible to link the moral status of a thing outside the human body to the status of some tissue destroyed in its creation” (p.37). Moreover, according to them, one cannot prescribe the traditional definition for viability of embryos (and foetus) when new medical breakthroughs lead to formation of embryos without the need of conception.

However, Ruiz-Canela (2002) states that there is strong opposition to research on human embryos as the 5-day old blastocyst is ‘not an ordinary cluster of cells’ or mere tissue but contains the genetic information needed for development, and therefore it is argued that respect for human beings should not be based on ‘developmental view’ but must be same regardless of the developmental stages. Brock (2006) pointed out that even to those who do not believe that a human embryo is a human person, hold the view that the embryo is not ‘mere tissue’ to be destroyed.

Conversely, Devolder and Harris (2007) claim that there is ambiguity on the ontological status (the nature of existence) of embryo and the claims about its special status are hard to support as there is not much research to reduce the high rate of embryo loss in natural pregnancy as well as assisted reproduction treatment.

Sandel (2004) points out that the way we respond to natural loss of embryos in pregnancy due to failure of implantation suggests that we do not regard it the same way as the death of a baby child. However, George & Gómez-Lobo (2005, p. 208) argue that unsuccessful pregnancies are due to incomplete fertilisation; therefore one cannot denote the lost of entity as a loss of human embryo. On arguments that people do not grief for embryo losses as much as they grief for the loss of their child do not justify that early embryos are not entitled to full moral respect, because the grievances are more to the fact of visible emotional bonding that they had with the child and that does
not explain why we should not give full moral respect to early embryos (George & Gómez-Lobo, 2005).

The US National Bioethics Advisory Commission (NBAC) states that research which inevitably involves the destruction of surplus embryos ought to be allowed to develop cures for life-threatening or severely debilitating diseases (NBAC, 1999).

As such, Baylis (2001, pp. 52-54) points out that the NBAC is trying to rationalise the killing of embryos and also demonstrating respect for embryos, therefore the use of the term “respect” itself is problematic.

Similarly, Callahan (1995) wrote, “I have always felt a nagging uneasiness at trying to rationalise the killing of something for which I claim to have a profound respect” (p.39).

What does this imply? If the early embryo is not entitled to the same respect as the developed life, would it then be ethical to conduct research using those early embryos which ultimately leads to their destruction? If these 5-day old embryos constitute of a mass of cells are considered like any other body tissues, then there would be no significant ethical restraints. Lebacqz (2001) says it is possible to specify a meaning for respect for embryos that will be used in research without the embryos being devalued or disrespected.

Again and again, we ponder whether a 5-day old embryo utilised in ESCR, actually denotes early life and is worthy of moral respect.

As to whether early embryos are worthy of moral respect, the notion of consciousness is argued as an important criteria to define presence of life, which is a pre-condition of sentient being, that is to have the capacity to feel pressure and pain.

However, until day 14 of fertilisation, the blastocyst has no nervous system, and therefore cannot sense pain, which is an attribute of a human being. Therefore, the embryos cannot be considered sensate before day 14. It is reasonable to consider the
phase when the possibility of sensation first exists as the beginning of human life (Fischbach & Fischbach, 2004).

Fischbach and Fischbach (2004) also reasoned out why the implantation of embryo (blastocyst) in the womb is the best landmark for definition of life. This is because the embryo is now defined as an individual, passing the stage in which it can undergo twinning.

The possibility of twinning at embryonic stage has been forwarded to suggest that embryos lack the value which is unique to individual persons and hence lose their moral status. This is related to the idea that at the early stages there is uncertainty; of the embryo resulting in a unique human individual or two (or more) individuals. It is only when twinning is no longer possible around day-14, individualisation begins.

However, scholars George and Gómez-Lobo (2005, p. 206) disagree to this as they opined that twinning does not indicate that embryo is a mere clump of cells just because cell detachments may take place at early stage of embryonic development.

On the other hand, the possibility of spontaneous twinning right to the stage of implantation has led other scholars to argue that those who insist ensoulment (inception of a soul) begins at conception would have a problem to account for the splitting of soul at that stage. (Devolder & Harris, 2007)

In relation to this, they argued that:

Those who think that ensoulment takes place at conception have a problem to account for the splitting of one soul into four, and the destruction of the three souls when the four embryos are recombined into one (Devolder & Harris, 2007, p.17).

Along with that, Marquis (2007, p.65) is skeptical of the argument that it is wrong to end the life of a five-day old embryo. Marquis sees detachment of cells as not
more than a ‘change in spatial location’. If one holds to the view that an embryo has a future value, so do all its cells and this would lead to something intangible, thus Marquis (2007, p.65) concludes that objection against human ESCR is not strong enough to warrant its prohibition. The two reasons are: (1) embryo would only have future value if its later stage is a human being whereby human being would be ‘phase sortal’\textsuperscript{11}, (2) the nature of embryo and possibility of twinning suggests that embryo do not have a future value.

As elaborated above, it can be surmised that a human embryo is worthy of protection after day 14 of fertilisation because (i) the end of twinning around day 14 marks individualisation, and (ii) formation of nervous system around day 14 marks the possibility of first sensation, and is a landmark in definition of life. Until day 14 of fertilisation, the embryo has not developed a nervous system and it cannot be considered sensate. Fischbach and Fischbach (2004) compared that to patients who are pronounced brain dead, but whose organs are donated to save lives of others. Their view is that these early embryos are cell donors with the same or lesser moral status than those patients.

Based on the above, it is worth asking whether the 5-day old embryo has full moral status and thus worthy of moral respect and protection, or whether it affords some special status, or whether the moral status of the embryo increases gradually with its development. Also, does the 5-day old embryo constitute life, or when does life actually begin? Does the embryo have human life but it is not considered as a human person? Since there is a high rate of mortality and high chances of spontaneously aborted, is the embryo worthy of moral respect? Prior to the formation of nervous system and the end of possible twinning at day 14, can the 5-day old embryo be regarded as worthy of moral respect? All these ethical considerations are surmised from the above review.

\textsuperscript{11} Phase sortal is a concept by philosophers in discussing identity
Precisely, the question worth asking is how are we to allow ESCR (involving destruction of embryos) while at the same time accord respect to early human life. This study seeks to explore the religious perspectives from the context of Malaysia in an attempt to answer the questions raised above.

2.1.1.2 Sentience, Personhood and Potentiality of Early Embryos

In discussions pertaining to moral status, sentience is viewed as a criterion. According to Bortolotti and Harris (2005, p.68), sentience is a “prerequisite for having an interest in avoiding pain”. Scholars argue that sentience of life is marked through sensory movement which takes place around 14 days after fertilisation. This is because up to 14th day of development, the blastocyst has no central nervous system and cannot be considered sensate (Fischbach & Fischbach, 2004).

However, Warren (1997) states that no single property such as sentience can serve as sole criterion for moral status. Warren (p.18) further argues that sentience is a being’s capacity to experience pleasure and pain which provides reason for recognising moral obligations not to kill it, but it is not regarded as a sufficient condition for full moral status.

Warren (1997) asserts that since “not all conscious experiences are either pleasurable or painful, evidence of consciousness is not necessarily evidence of sentience” (p.55). On this account, one is impelled to suggest that since consciousness is not necessarily a condition of sentience, it also does not indicate one’s moral status.

George and Gómez-Lobo argue (2005, p.204) that to give moral respect to human beings based on their acquired characteristics is untenable, as one need not have
to be ‘conscious, reasoning and deliberating’ in order to earn full moral respect taking into account people who are in ‘reversible comas do deserve such respect’. The argument is that every human being should be entitled to the same moral respect regardless of their acquired characteristics and their current state of mind. The concern here is how we apply this view in the context of a 5-day old embryo.

Another criterion to moral status is the concept of personhood. The conceptual link is arguably between being a person and having full moral status, says Warren (1997, p.91).

According to Bortolotti and Harris (2005, p. 68), personhood is a ‘prerequisite to continue one’s own existence’.

Warren (1997, p.19) argues that personhood referring to mental capacities, that are ‘subsumed as rationality and self-awareness’, is a sufficient condition but is not a necessary condition for full moral status taking into account the mentally disabled.

Fischbach and Fischbach (2004) draw a comparison between cases where organs are removed from a patient who is alive but declared brain dead to save other lives, with the act of extracting stem cells for therapeutic purposes from early embryos which have not developed nervous system. In this context, the moral status of the early embryos is viewed same or lesser than those brain dead patients.

However, by just referring to the development of the human mental functions as a quantitative criterion does not justify why one deserves moral respect and the other does not (George & Gómez-Lobo, 2005, p.205). Human being whose mental functions are deteriorated are also living beings who deserve moral respect.

On that point, Warren (1997) raises grounds objecting Kant’s deontological theory which places emphasis to personhood. Warren argues that Kant’s claim that only rational beings are ends in themselves, would seem that human beings who are not “moral agents are not ends in themselves, and do not have moral rights” (p. 101).
To extend this view in the context of a 5-day old embryo, one has to ask whether the embryo has the same basic moral rights for it to be accorded moral status as other sentient human beings, though it may not be a human person yet.

On that point, Harman (2007, p.84) states that creating embryos and then destroying them to extract stem cells is permissible only if the destroyed embryos lack moral status. Harman offered an alternative argument, called *Ever Conscious View*: “pre-conscious embryos that will die without ever being conscious lack moral status” (p.84). This means that ‘pre-conscious’ embryo, according to Harman (p.83), would have lacked moral status if it died before coming conscious, and that killing it would mean killing something that lacked moral status and as such the killing is permissible.

At this juncture, another point to note is the argument that a landmark definition of life lies in the end of possibility of twinning around day 14 after fertilisation, which marks the individualisation of the embryo. McCormick (1991) has argued about ‘attainment of developmental individuality’. Accordingly, an embryo which has developed to a point into one individual differs in moral status from an early embryo which has not become a definite individual. However, this argument is refuted by Orr (2002) who argues that these embryos are already human individuals with the potential of becoming twins.

On this account, it is worthy to note that formation of primitive streak at 14 days of gestation is taken as one reference point in development of human individual (Warnock, 1984, 11.22). This was the reasoning behind the Warnock Committee’s recommendation of no embryo research beyond 14 days (Warnock, 1984). The reason is that only when twinning is not possible anymore, a unique organism is formed. That is why the Warnock Committee recommended that embryo research should be limited to the first 14 days of development. It is important, however, to take note that the Warnock report does state that embryo ought to have a special status and afforded some
protection (Warnock, 1984, 11.17). Nonetheless, it is unclear as the report does not address whether the embryo is a person, though it has outlined the said conditions.

This 14-day limit is also articulated in the International Society for Stem Cell Research guidelines (ISSCR, 2008). Accordingly, the ISSCR guidelines prohibit in vitro culture of human embryos beyond 14 days or after formation of primitive streak. This 14-day limit is widely accepted among the researchers in the human stem cell field, recognising the biological differences between an early embryo and an embryo that has begun its organogenesis [organ creation] (Daley et al., 2007).

According to the United States President’s Council on Bioethics (2002, Chapter 6) report, there are sound moral reasons for not regarding early embryo in the first 14 days as the ‘moral equivalent’ of a human person, and that the embryo can be used for life-saving research, though it commands more respect than other [ordinary] human cells. This view is developed by considering among others, the possibility of twinning and moral significance of implantation. The possibility of twinning suggests that an early embryo is not an individual yet. It is only after 14 days or after the formation of primitive streak, the ‘being’ is a single being. On the moral significance of implantation, it is argued the IVF embryos produced in the lab differ from those embryos that are conceived and naturally implanted in the woman’s womb without the assistance of technology and human artifice. According to the report, the significance of implantation is that the self-direction of embryo towards birth becomes possible without any external human artifice. That distinguishes the moral status for IVF embryos created for research with those embryos naturally conceived and implanted in the womb. That means, the moral status of an embryo in the petri dish in the laboratory (if at all it has moral status), would differ from that of an embryo implanted in a woman’s womb.
In debating about the moral status of embryo, the individuality and potentiality of an embryo is also of concern. The human embryo has the potential to develop into a human being if nurtured in the right environment. Thus, there is opposition to ESCR on the grounds that the destruction of embryo prevents the embryo from fulfilling its potential. The counter-argument is that *in vitro* embryos have no potential to develop into human being if they are not implanted in a woman’s uterus that provides the necessary conditions for development. On this account, UNESCO IBC (2001, p.10) states that since there is no possibility of implantation and so the embryo has no potential to develop into a human being, it is then ethically defensible to use these embryos for therapeutic research purposes.

On the contrary, embryos ‘lacking interest’ in themselves, however, deserves special respect due to their potential to develop into foetus if implanted in the uterus (Robertson, 1999). McCormick (1991) highlights that it is important to consider that embryo’s potential for personhood and as such deserves profound respect, and proposes that early embryo should be treated as a person due to many uncertainties in deliberating its status.

Meanwhile, Hanson (2006) questions whether potentiality of embryo differs from that of *in vitro* embryos? Hanson argues that a frozen embryo cannot develop without external aid as it lacks active potential, and therefore the potentiality of embryos in pregnant women differs from that of the frozen embryos used in research. If this is agreeable, then the argument against ESCR on the basis that embryos have potentiality to develop into person does not hold.

Here, an important question to ponder is whether research on early embryos reduces their value to instrumental tool.

Reflecting on all these, the United States President’s Council on Bioethics (2002, Chapter 6) report, sums up that it is possible to accord ‘special respect’ to early
embryos while utilising them in research. The reason for this is that the Council assigns intermediate status to human embryo. Accordingly, those who regard early embryos as “mere” cells are ignoring the inherent connection to the origins of human life. It would be a ‘mischaracterisation’ to define potentiality per se, as there is a difference between having the capacity to become anything with having the capacity to be something in particular, which is an individual human person. At the same time, the early embryos cannot be treated as morally equivalent to a human person because the absence of “consciousness”, “the capacity to express needs”, and “the capacity to feel pain” in early embryos suggest that they have not developed enough to be defined as a truly human person.

As such, it can be argued that research on the so-called nascent human life, that is the 4-5 day old embryos for life-saving researches, is justified as the embryos cannot be accorded the same protections and rights given to a human person, although it commands special respect.

2.1.1.3 Moral questions on the Use of Surplus and Research Embryos

As stated in Chapter 1, the sources of human embryonic stem (hES) cells include:

(i) embryos created by In Vitro Fertilisation (IVF) for infertility treatments which are no longer needed, denoted as ‘surplus’ embryos (Dickens & Cook, 2007);

(ii) embryos created via IVF solely for research purpose (Lanzendorf et al., 2001), denoted as ‘research’ embryos.

Couples who undergo IVF treatment would end up with surplus embryos which are no longer needed and they can either opt to discard the embryos, or donate them to
another couple or for research purposes (Braverman et al., 2009). Consent needs to be obtained from couples who decide to donate the surplus embryos for research, and the consent process should inform donors of the nature of ES cell derivation (Braverman et al., 2009). When research cannot be carried out on surplus embryos alone, embryos are then created via IVF from gametes donated by volunteers who have no reproductive intent. Human gametes which are, oocytes (egg cell) and sperms donated by anonymous donors are inseminated and cultured to form blastocyst, which is later extracted to produce human embryonic stem cell lines. These embryos created solely for stem cell research purposes are termed as research embryos.

As discussed in previous sections, ethical dilemma concerning morality of ESCR using early embryos revolves around the moral status of those embryos, which can be surmised as follows:

- Does an embryo have a moral status, and does the status of an embryo differ from that of an adult human being?
- Should an embryo be given the respect and protection that a human being deserves?

Now, the aforementioned ethical questions need to be further examined with regards to the use of surplus and research embryos in ESCR.

Acknowledging the fact that the embryonic stem cells can be derived from surplus embryos from infertility treatments, or from research embryos created solely for research, Steinbock (2000) argues that there is no moral difference between utilising surplus or research embryos in stem cell research.

On the other hand, the ‘discarded-created distinction’ has been forwarded to support that is there is a moral difference between doing research on surplus embryos originally created for reproduction purpose, with the research embryos created with the
sole intention of using them for research (Parens, 2001). The latter raises more ethical controversies.

In view of respecting human embryos, the argument is that rather than letting the surplus embryos go to waste, using them to save lives, is a way of treating the embryos with respect. Using surplus embryos instead of discarding, for research that has the potential to benefit lives of human beings are encouraged (Manninen, 2007, p. 100).

However, is there a moral difference between letting the surplus embryos to die and destroying those embryos to harvest stem cells for research?

On that account, McMahan (2007) who examined the common grounds and assumptions in making comparisons between infertility treatments [which involves creation of surplus embryos] and human embryonic stem cell (hESC) research [which involves destruction of five-day old embryos in the process of extracting stem cells] states:

“…if there is a objection to using embryo as a means, and if the distinction between killing and letting die has [moral] significance,…then there are reasons to think that assisted conception is less morally objectionable than hESC research, - though these reasons may be offset to a considerable extent by the greater goals of hESC research” (McMahan, 2007, p. 37).

McMahan (2007, p.37) further noted that hESC research aims to find cures for debilitating diseases while assisted conception primarily enables infertile couples to have babies.

Although there is a distinction between ESCR and infertility treatments, does using surplus embryos for ESCR which otherwise would be discarded lift the prohibition against destroying them?
According to scholars, the life of a 100-cell embryo is in its cell nuclear DNA. When inner cell mass (ICM) cells are extracted from embryo for cultivation, the DNA is ‘preserved’ and therefore the embryo is not ‘sacrificed’ (de Wert & Mummery, 2003, p.675). However, they noted that this point is disputable since the embryos sacrificed for research is ‘masked’. Lindsay (2009, p. 234) argues that it is technically incorrect to use the term ‘destroying or killing the embryo’ because the embryo from which the ICM has been removed will not develop into a foetus, but the cells extracted will ‘remain alive far longer than they would have if the embryo has continued to develop’.

Now, should we just allow the surplus embryos to die? The Warnock Committee in its report stated that it is satisfied that surplus embryos may be used as subjects for research (Warnock, 1984, 11.24). The Warnock Committee recommends that research on human embryo should be conducted only under license and stringent monitoring (11.18) (Warnock, 1984). However, it should be noted that this report was published prior to ESCR discovery in 1998, but is it still largely referred to.

In reference to Callahan’s (1995, p.39) statement that “I have always felt a nagging uneasiness at trying to rationalise the killing of something for which I claim to have a profound respect”; Manninen has (2007, pp. 90, 98, 101) refuted by arguing that the proper respect for surplus embryos is manifested by using them in research which allow their existence to have a [positive] impact on the world, rather than just to discard them. Manninnen further added that respect for surplus embryos entails the ‘moral permissibility’ of using them for ESCR. In view of IVF practices that create thousands of surplus embryos which will be disposed, it is only respectful that these surplus embryos are used in potentially life-saving research. These embryos lack moral status as they are nowhere near mid-gestation point and the use of surplus embryos for stem cell research indeed gives proper respect to the embryos (Manninen, 2006).
Sandel (2004) points out that if it is immoral to sacrifice embryos for treating diseases, then we should consider it immoral to sacrifice them for sake of treating infertility. It is to be noted that the benefits from ESCR promises to bring relief to larger group of patients as opposed to the infertility treatment which only caters to the need of a couple.

The important controversy which is the fundamental issue and focus point of this study, is whether it is morally wrong to create embryos for research purposes which are inevitably destroyed in the process, with no intention to create babies. At this point, we have to give careful thought to the way we distinguish the research embryos from the surplus embryos available for research only when they are no longer required (Parens, 2001, p.43).

According to UNESCO IBC (2001, p.10), surplus embryos have no future. Taking into consideration that the therapeutic intention can ‘contribute to the ethical choice’ of employing the use of human embryos, it is ethically permissible to utilise the surplus embryos for therapeutic research purposes, as the only other option is their destruction [discarded as waste].

According to Robertson (1999), only when research using surplus embryos is deemed acceptable, the question whether embryos can be created and destroyed for research arises. Robertson conclusively puts it that those who are against research using surplus embryos will also oppose using research embryos; but there are those who approve the use of surplus embryos who (might) disagree to the latter.

Parens (2001, p.53) highlighted the United States Human Embryo Research Panel (HERP) 1994 report, that the intention to create embryos for research purpose has led us to think that “they are mere means to ends rather than as ends in themselves”.

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It is worth asking whether using surplus embryos as means to achieve the ends decreases respect for human life. On the other hand, is it justified to create research embryos for ESCR?

This very much brings us to Kant’s categorical imperative whereby rational beings must be treated as ends to themselves. However, Manninen argues that given the fact that embryos lack consciousness and rationality, one cannot denote that embryos fall into that category (Manninen, 2007; 2008). In the same manner, Warren (1997) claims that Kant’s maxim is subjected to objections as far as embryo is concerned. Warren (1997, p.101) raises grounds objecting to Kant’s deontological theory which places emphasis to personhood. Warren argues that Kant’s claim that only rational beings are ends in themselves, would seem that human beings who are not “moral agents are not ends in themselves, and do not have moral rights. Along that line, Steinbock (2006) points out that the Kantian respect cannot be applied to early embryos since they do not have interests and goals, so they are not ‘ends in themselves’.

The United States National Bioethics Advisory Commission (NBAC, 1999, p.56) has highlighted the discarded-created distinction, on the moral difference between surplus and research embryos. Surplus embryos are created for reproduction purposes and when they are no longer needed in infertility treatments, these embryos are either discarded or become available for research; whereas research embryos are those that are solely created for research purposes. The latter raises concerns about ‘instrumentalisation’ and treating embryos as mere objects. According to the commission report, this leads us to ‘think of embryos generally as means to our ends rather than ends in themselves’. On that point, Steinbock (2006, p.438) submits that if Kantian respect cannot be applied to early embryos since they do not have interests and goals, then we cannot treat those embryos as ends in themselves. Steinbock adds that as much as creation and destruction of surplus embryos which is a very much part of IVF
is justified for reproduction purposes, so is the creation and destruction of research embryos aimed to improve people’s health. Thus, Steinbock concludes that neither the creation and use of surplus embryos nor research embryos ‘contravene the respect for embryos as a form of human life’ (p. 438).

Besides respect for embryonic life, critics also advocate the principle of non-maleficence (‘do no harm’) when dealing with embryo research. One cannot justify the harm inflicted to an embryo by referring to the benefits of the research in saving people. Does the act of manipulating embryos for research viewed as inflicting harm on embryos? Mahowald in her reply to Gomez-Lobo, says that respect for human embryos does not necessarily entail that it is morally wrong to destroy them (Mahowald, 2004).

Harman (2007) asked, if the practice to destroy embryo is unfair to embryo, does it mean the practice is immoral? Here, one has to understand that the act of destroying embryo must not only be seen from the human being’s perspective, but also from the value point of an embryo. Interestingly, Harman (2007) states that although destroying surplus embryos may cause harm to the embryo by depriving it of a chance to live as a person, the harm is not significant as it very unlikely to get to live as a person.

On that point, the argument to grant respect to human embryos simply because they represent the beginning of human life on the basis of symbolic value of the embryo only challenges the permissibility of ESCR (Bortolotti & Harris, 2005).

Hanson (2006) argues that if one were to see that destruction of embryo in ESCR as killing, then [referring to infertility treatment], one should also hold that the embryo that is frozen, thawed and implanted and subsequently grows into a human is actually killed before birth.

Robertson (1999, p.128) points out that the ethical acceptance of creating research embryos for ESCR “will thus turn on to the symbolic meanings associated to
such practices in light of the research benefits”. Robertson adds that some would argue that creation of research embryos only to destroy them later “raises symbolic harm, beyond that which exists with research using surplus embryos, and which cannot be justified by benefits that the research might bring” (p.128).

Biologically, however, the moral concern of harming the embryo does not arise because a five day old embryo has not developed the primitive streak as a pre-condition for a developing conscious being. The 5-day old embryo has not developed a nervous system and thus it cannot sense pain.

Islam, Rusli, Ab Rani and Hanapi (2005) from Malaysia wrote on ethics of different policies in the Western world with regards to surplus embryos and ESCR. They defended ESCR as a new frontier in biomedicine, by exercising the 14-day rule in utilising surplus embryos for research.

At this juncture, it is worthy to note that Outka (2002, p.193) has extended the ‘nothing is lost’ principle. The principle states two conditions: (1) the innocent will die in any case and (2) another innocent life can be saved. Here, surplus embryos from infertility treatment satisfy the first condition, and the innocent lives suffering from diseases satisfies the second condition, which means employing surplus embryos in research for therapeutic purposes is in line with the aforementioned principle. According to Outka (2002), the creation of research embryos should be resisted, but research on surplus embryos is permissible.

Moral questions are raised in regards to the use of surplus and research embryos. In summary, some of the important concerns raised by scholars are as follows:

- How does the moral status of surplus embryos differ from that of research embryos? Does utilising surplus embryos for research show a lack of respect for the embryos? (Hug, 2005).
• Is using research embryos morally worse than using existing surplus embryos? (Hug, 2005).

• Should embryo use be limited to surplus embryos or can it include research embryos? (de Wert & Mummery, 2003).

A common question on the moral use of both surplus and research embryos for ESCR is whether it is ethical to conduct research on human embryos (which are regarded as living entities) for the sake of treating diseases. A further consideration is whether the therapeutic benefits of using embryonic stem cells contribute to our ethical choices.

The common argument is that it is ethically defensible to use surplus embryos for research and therapeutic purposes as those embryos have no future. However, is creating research embryos justified to derive stem cells for therapeutic purposes, and does that undermine the respect for human body?

All these ethical concerns need to be examined in the Malaysian context with regards to the use of surplus and research embryos in ESCR. This is what this study attempts to explore, on the ethics of ESCR from the perspectives of the Buddhist, Hindu and Catholic groups in Malaysia. At present, Malaysia’s current Guidelines on Stem Cell Research and Therapy is based on fatwa ruling from the Islamic Council (MOH, 2009a), which takes the middle-way approach to allow the use of surplus embryos for ESCR, but prohibit the generation of research embryos.
2.2 Religious Considerations

In view of the ethical discussions on when human life begins and whether a 5-day old embryo can be regarded as having life, it is pertinent that those concerns are addressed and reflected from the religious context. This is more so in countries such as Malaysia that are strongly rooted in religious beliefs.

The views from the major religions in the world, namely Islam, Buddhism, Hinduism and Christianity, are sought as guidance in ethical discussions, mainly on fundamental issues like nature of life. Diverse views exist within and among religious traditions on when life begins. The perceptions on the moral status of human embryo vary with the religions, and Malaysia is no exception. This would further result in varying viewpoints regarding the positions taken by those religions on permissibility of ESCR itself.

In projecting the relevance of religion on life and moral status, Miller (2008, p.157) stated that, in addition to the three concepts: (i) life and moral status begins at conception, (ii) life begins at conception but moral status depends upon degree of development, (iii) personhood and moral status are social constructs; Miller has added a fourth view which is:- religious view about ensoulment as the basis of moral status, and when ensoulment occurs varies according to every religion.

The basis of religious guidance on when human life begins essentially revolves around the notion of ensoulment in Islam, Catholicism and Hinduism. From the religious perspective, ensoulment refers to the moment when a human being acquires a soul marking its individual existence and personhood. However, Buddhism does not believe in the presence of an eternal soul (Dhammananda, 2002, p.152). This makes the concept of personhood unclear. Instead, Buddhism refers to ‘annata’, the teaching of no-soul, non-self, equating to consciousness as continuation of an entity
To a certain extent, this appears similar with the concept of ensoulment.

Reflecting on pluralistic views, UNESCO IBC (2001, p.7) cautioned that the major religious position on the use of embryos in ESCR reveals stark differences on the status of embryo, and therefore only if it is defined in a broader perspective, there will be room for agreement.

The following section outlines the literature on the perspectives and positions of Islam followed by other main religions such as Buddhism, Hinduism and Catholicism on ESCR.

2.2.1 Islamic Perspectives and Positions on ESCR

In multi-religious Malaysia, Islam is the religion of the Federation as enshrined in Article 3(1) of the Federal Constitution (Fernando, 2006). However, the Constitution guarantees the freedom of other religions to be practiced freely in harmony. Based on the last census in 2010, the population in Malaysia is made up of 61.3% Muslims, 19.8% Buddhists, 9.2% Christians and 6.3% Hindus (Department of Statistics Malaysia, 2010).

Interviews were not conducted on Muslim authorities because there is consensus on the issue in the form of fatwa. Nevertheless, this section explores the Islamic responses gathered both from local and international writings pertaining to ethics of ESCR.

Islam is the youngest of the three monotheistic faiths [other two are Judaism and Christianity]; and questions about what is regarded as appropriate behaviour in Islam
need to be addressed (Sachedina, 2005). The four sources of Islamic law are the Quran, Sunnah [sayings and actions of Prophet Muhammad also known as Hadith], Ijma [consensus] and Qiyas [analogy] (Nordin, 2006).

In dealing with contemporary issues, in the absence of specific references from the Quran, and Sunnah, the Islamic scholars/jurists derive new rulings by the process of *ijtihad* [independent judgment] which is accomplished through Ijma or Qiyas in order to issue a *fatwa* (Fadel, 2012).

Along with the Shariah (Islamic laws), the procurement of judgments is dependent on reasons used in moral deliberation (Sachedina, 2005). Sachedina points out that the underlying principles and rules of practical ethical guidance should be referred to when faced with an ethical dilemma. Rispler-Chaim (1989) points out that when it comes to medical treatment, Muslims usually refer to the Shariah to decide if a treatment is acceptable within Islamic law. According to Malaysian scholars, any biotechnology applications must satisfy one of the five purposes outlined in the Shariah if it is to be deemed ethical, and one of the corresponding purposes is ‘preservation of life and health’ (Amin et al., 2011a). This can be applied in the ESCR context which aims to save lives and improve the health of people suffering from debilitating diseases.

The institutionalising of Islam also has significance in Malaysia’s public domain. This is illustrated in the derivation of Islamic rulings or *fatwas* to address and monitor controversial issues in biomedical research and its applications that would particularly affect Muslims. *Fatwas* are formulated by various state fatwa councils as well as the National Fatwa Council after the religious scholars and authorities undergo ethical reasoning (*ijtihad*).

Malaysia’s current *Guidelines on Stem Cell Research and Therapy* is based on a *fatwa* ruling from the Islamic Council (MOH, 2009a), which takes the middle-way approach. The use of surplus embryos is referred to the decision of the *fatwa* committee.
dated 22nd February 2005 (Department of Islamic Development Malaysia, 2005). Accordingly, surplus embryos from IVF trials may be allowed to be used for research with the consent of the couple provided they have completed their family. However, the creation of human embryos solely for research by any means including Assisted Reproductive Technology or through Somatic Cell Nuclear Transfer (SCNT) is prohibited. This is in line with the fatwa issued by three Islamic Fiqh (Jurisprudence) Councils in Jeddah, USA and Jordan (Nordin, 2011).

The following section examines the Islamic positions deliberated by Islamic scholars vis-à-vis ESCR based on two principles - (i) knowledge-seeking research benefit mankind, and (ii) sanctity of embryonic life. Though there are other Islamic values such as niat (intention) and mafsadah, this study attempts to focus on the abovementioned two principles only, which are cited extensively in global writings when discussing about Islamic responses on ethics of ESCR.

(i) Knowledge-seeking research benefit mankind

Scientists conduct extensive research and investigate how stem cells can be used in the treatment of diseases and to advance knowledge on how cells develop and repair itself. This knowledge-seeking scientific endeavour for the benefit of mankind is encouraged in Islam.

Stem cell and embryo research have not faced much resistance in Arab and Islamic countries like Egypt, Iran, Turkey and Malaysia due to the nature of Islamic medical ethics (Rispler-Chaim, 2006) which encourages humans to seek knowledge. Weckerly (2002) points out that Islam’s obligation to seek knowledge has led many Islamic scholars to support stem cell research.
Islam believes that knowledge emanates from God. The flexibility of Islam when dealing with biomedical innovations and the importance of saving lives in Islam is cited in most deliberations on the ethics of stem cell research (Al-Hayani, 2008) and the following verse is often quoted;

Whosoever saves the life of one [human], it shall be as if he saved the life of all humankind  [Quran 5:32].

This statement implies that saving lives of people who suffer from pain is given great importance. This can be viewed as opening the doors for ESCR. If ESCR can relieve the suffering of people, then it is denoted as ‘obligatory’ under Fardu Kifayah [societally requisite knowledge] (Siddiqi, 2002).

Hence, it becomes a duty for the scientists, the people of knowledge, to assist those in society who can benefit from that knowledge. Delivering public goods is in accordance to the principle of maslaha. Similarly, the use of surplus embryos in research instead of being discarded for the purpose of benefiting the society is in accordance to the principle of maslaha (Rispler-Chaim, 2006). Therefore, donating surplus embryos for research aimed at saving lives is a ‘societal obligation’. On that note, Serour (2005) states that in Islam embryo research using surplus embryos donated by couples, is allowed for the advancement of scientific knowledge and benefit of mankind.

Prophet Muhammad is quoted as saying that God obliged humankind to find for cures without using prohibited substances (Rispler-Chaim, 2006). Islam encourages seeking remedy and treatment as stated in the Hadith (Al-Bukhari), “there is a cure for every illness though we may not know it yet” (Aksoy, Elmali & Nasim, 2007). As such, the development of new treatment methods is strongly recommended and ‘commanded’ as long as it is not ‘categorically prohibited’ in accordance to Islamic
laws, and it is aimed at improving human health (Aksoy et al., 2007). As such, ESCR which aims to improve health of people suffering from debilitating diseases is allowed.

Although ESCR does not immediately result in a cure for diseases, the research itself may contribute towards a better understanding of body functions at cellular level which is valued as knowledge-seeking from the perspectives of Islamic ethics. Thus the issue is no longer about finding cures for diseases but about the ‘increase of knowledge’ (Ilkilic & Ertin, 2010).

Sachedina (2000) cautiously puts it that it is an act of faith to carry out ESCR if it is for the purpose of improving health:

The will of God in the Koran has often been interpreted as the processes of nature uninterfered with by human action. Hence, in Islam, research on stem cells made possible by biotechnical intervention in the early stages of life is regarded as an act of faith in the ultimate will of God as the Giver of all life, as long as such an intervention is undertaken with the purpose of improving human health (Sachedina, 2000, p.G6).

The destruction of embryos is justified if the intention is to alleviate the suffering of people, which is interpreted as the lesser of two evils (Nor, 2010). As such, priority towards saving the lives of human adults outweighs any ethical conscience associated with the use of embryos.

The argument is if the surplus embryos, in any case, are destroyed, then there is no reason why these embryos should not be used in ESCR for the public good (maslaha) aimed at providing treatment for debilitating conditions (Saniei, 2012).
(ii) Sanctity of embryonic life

The fundamental question here is when life begins and whether a 5-day old embryo is considered a living entity. For that, the status of an embryo needs to be defined. The basis of religious guidance on when human life begins essentially revolves around the notion of ensoulment in Islam. The Quranic teaching about human development is as follows:

And indeed We created man from a quintessence of clay. Then we placed him as a small quantity of liquid (nutfa) in a safe lodging firmly established. Then we have fashioned the nutfa into something which hangs (alaqa). Then We made alaqa into a chewed lump of flesh (mudgha). And We made the mudgha into bones, and clothed the bones with flesh. And then We brought it forth as another creation. So blessed be God, the best to create!\(^{12}\) (Quran 23: 12-14)

In reference to the verses, Sachedina (n.d) interprets that “perceivable life is possible at later stage in biological development of embryo when God says: “we brought forth as another creation.”

Muslim scholars generally agree that ensoulment which is the ‘breathing of spirit’ into embryo, is what differentiates biological life from human life (Fadel, 2012). Reflecting on an ancient text, Fadel (2012) claims that it is only after ensoulment that the embryo acquires personhood. The process of ensoulment is referred as: “and breathe into him of His spirit” (Quran 32:9), and supported with a Hadith:

Verily your creation is on this wise. The constituents of one of you are collected for forty days in his mother's womb in the form of blood, after which it becomes a clot of blood in another period of forty days. Then it becomes a lump of flesh and forty days later Allah sends His angel to it with instructions concerning four

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\(^{12}\) In modern terms, we can equate nutfa as water drop, alaqa refers to embryo and mudgha refers to foetus.
things, so the angel writes down his provision, his death, his deeds, his fortune and misfortune. Then the soul is breathed into him.

Hadith - cited in (Aksoy, 2005, p.401)

Each stage of human development takes forty days, which brings the total to 120 days. In Malaysia, the above teachings have been decisive on the ruling on abortion which is prohibited after the ‘third fortieth’ (120th) day. This is agreed by the Shafie jurisprudence and termination of pregnancy is only permissible when the mother’s life is in danger or other necessities deemed in accordance with the Shariah principle which order committing the lesser of two evils (Muhammad Husin et al., 2013; Tengku Zainuddin, 2001). Some scholars imply that ensoulment occurs after 120 days. Based on that, scholars point out that abortion is allowed in Islam until end of fourth month after fertilisation (Larijani & Zahedi, 2004). If we were to apply the same concept, then we can argue that ESCR involving the destruction of 4 - 5 day old embryos is permissible.

However, for some Muslims, ensoulment takes place after 40 days (Eich, 2003). Aksoy says that the completion of certain physical forms and ensoulment takes place after 40 days of conception and he opined that the angel breathes in the soul into the embryo between 49 to 55 days of conception (Aksoy, 1998, 2005). A minority view among jurists is that ensoulment takes place by the first 40 days of embryo development, and therefore the 40-day limit is preferred to be on the safe side. Whichever way it is perceived, ensoulment indicates presence of life in an embryo and scholars generally agree that ensoulment takes place between 40 to 120 days. As such, ESCR that utilises 5-day old embryos is not unethical (Rispler-Chaim, 2006).

The plurality of views in Islamic circles about when life begins has made Islamic ethics on ESCR irresolvable. However, the legal verdict related to IVF and
stem cell research is not strictly forbidden (*haram*) but rather a lighter ruling, ‘not encouraged’ (*makruh*) (Nor, 2010). Malaysian Muslims who generally belong to the Sunni school of thought have adopted the resolution of the Muslim World League which takes the majority view that ensoulment takes place 120 days after fertilisation (Nordin, 2011).

Aksoy argued that identifying the exact time of ensoulment may prevent terminating lives of ‘actual human persons’ (Aksoy, 1997). However, a survey on Muslim scholars, by Eich (2003), demonstrates that the majority do not consider embryo in its early developmental stage as a person.

At this point, the ‘moral implications of ensoulment’ as a basis for ethical debates vis-à-vis ESCR need to be explicitly discussed (Ilkilic & Ertin, 2010). Accordingly, ESCR using human embryos is ethically permissible when viewed from the vantage point of ensoulment (that the embryo only becomes human after ensoulment). Islamic tradition views ensoulment as a central value in the discourse of the moral status of an embryo. However, if we were to take that ensoulment only gives rise to a ‘gradual change in the moral value of embryo’ then the argument against the embryo’s right to protection from beginning of its existence is hard to maintain (Ilkilic & Ertin, 2010).

Embryological knowledge is of paramount importance in establishing views on ESCR. Writers have referred to Quranic verses and the Hadith to suggest that the womb provides the environment for development of ‘complete’ human being and therefore embryos in the lab cannot be equated to that of a foetus in the womb (Nor, 2010; Siddiqi, 2002). Quran describes the creation of human beings within ‘three fold of darkness’ called uterus. The absence of uterus in IVF embryos takes away the moral rights of those embryos (Nor, 2010). Nor argues that the womb provides the environment for the development of ‘complete’ human being and therefore embryos in
the lab cannot be equated to that of a foetus in the womb. Siddiqi (2002) points out that the Shariah makes a distinction between actual and potential life, adding that a fertilised ovum in the petri dish has potential to grow into a human being but it cannot survive as a human being as it is not in its natural environment - the woman’s womb. Siddiqi (2002) further argues that research should concentrate on surplus embryos which otherwise will be discarded.

The Quranic verse 5:32, states that:

Whosoever has spared the life of a soul, it is as though he has spared the life of all people. Whosoever has killed a soul, it is as though he has murdered all of mankind.

The above teaching is the reason for Islamic scholars putting forth their views on sanctity of life from the point of ensoulment.

Muslim scholars agree that embryonic life is worthy of respect but lacks the full sanctity before ensoulment, and only acquires full rights after ensoulment (Fadel, 2012). Based on the concept that human life does not start until ensoulment, the majority of Muslim scholars agree that research on early embryos is allowed as long as they are produced ‘legitimately’, such as the surplus embryos produced legitimately between legally married couples at the infertility clinics (Fadel, 2012). However, all Islamic jurists are of the opinion that creating research embryos solely for research is impermissible (Fadel, 2012).

Ilkilic and Ertin (2010) pinpointed that based on the ethical arguments within the Islamic community, the widely accepted position among most Muslim scholars and Muslim countries is synonymous to option 3 outlined by Walters (2004), that is research is permitted on surplus embryos which are no longer needed for reproduction.

In short, the Islamic position on ESCR is that using surplus embryos is allowed but creating and employing research embryos is strictly prohibited.

13 Walters six policy options outlined in Section 1.9.5 of this study.
2.2.2 Perspectives of Other Major Religions on ESCR

Though there may be plurality of views from different school of thoughts, one can find deliberations by scholars and representatives from Islamic global community on ESCR. The same cannot be said about Buddhism and Hinduism as there seems to be a lack of resources on their positions regarding ESCR. As far as the Catholic community is concerned, there is a univocal voice among the Catholic churches worldwide adopting the stand taken by the Vatican, the official teaching authority.

The positions of the other faiths concerning science and reproductive technologies are, however, ‘less categorical’ and more diverse (Frazzetto, 2004). Walters (2004) noted that there is a ‘centralised authority’ in Catholicism from the Vatican. On the other hand, the religious texts of the Hindus and Buddhists are interpreted by religious leaders resulting in a wide range of viewpoints.

This section will examine the Buddhist, Hindu and Catholic views on ESCR, though the relevant resources are limited.

ESCR appears to be in accordance with the Buddhist tenet [beliefs] of seeking knowledge and alleviating human suffering. However, some Buddhist scholars have shown that it actually constitutes an element of harm (Knowles, 2009). Keown (2004), a renowned writer on Buddhist ethics, points out that Buddhism does not support research on human embryos that entails the destruction of human life. On the other hand, in a well-reasoned paper, Promta (2004) makes a distinction between personal and social ethics in Buddhism. The use of stem cells in research, which could mean destroying ‘life’, may be viewed as ‘socially’ moral if it is intended to cure the disease of a human person, but this contradicts with Buddhist ‘personal’ ethics, which emphasises that destroying the embryo is a violation of its right to life. Looking at the society at large, Promta (2004) raises the question of the conflict between the benefit of
the greater number of people and the violation of embryo’s rights. Promta (2004) highlighted the ‘enforced donation’ found in Buddhist social ethics, in which a rape victim has the right to abort the child, and the child is perceived as an enforced donation. In the same manner, destruction of a 5-day old embryo in ESCR can be justified if it is for the sake of mankind.

The fundamental precept of Buddhism against harm and killing is also recognised by the Singapore Buddhist Federation, but supports utilising non-sentient pre-implantation embryos in ESCR if it has the intention of helping humankind (Singapore BAC, 2002, G-3-33). Note that the 5-day old embryo referred to as non-sentient entity, which means the sentience of embryonic life only comes in at the later stage of development when the consciousness of the embryo is significant. The concept of sentience and consciousness are referred by Buddhist scholars to deliberate on the presence of life in early embryos. Buddhism does not deliberate the presence of life from the notion of ensoulment. Buddhists believe in annata or concept of ‘non-soul’ (Dhammananda, 2002, p.155).

Hindu deliberations centre on the concept of karma and ramifications. In Hinduism, conception is believed to be the beginning of the soul’s rebirth from a previous life (Knowles, 2009). Hindus believe the soul (atman) transmigrates from one life to another and thus the [present] life is seen as a transition between the previous one and the next (Firth, 2005). Hindu deliberations on ESCR, however, are rather limited. Hindu deliberations may be found in Swami Tyagananda’s lecture where the destruction of life is held as bad karma unless the act is unavoidable and carried out for the ‘greater good’ of humanity (Tyagananda, 2002). Meanwhile, the Singapore Hindu Endowments Board cautiously allows the use of stem cells from 5-day old embryos to establish stem cell lines in culture. It accepts the use of embryonic stem cells aimed at
protecting life and finding cures for diseases, while making it clear that killing a foetus is a sinful act (Singapore BAC, 2002, G-3-2).

There seems to be no unanimous position on ESCR as far as Buddhism and Hinduism are concerned. But, Catholicism maintains the notion of sanctity of life and emphasises the inviolability of early embryonic life, thus objecting to ESCR. Catholics believe that embryo is a human life from moment of conception which deserves protection and respect (though they recognise the fact that the embryo is not a human person yet). The Catholics also hold the belief that the soul which is the sign of life is present from point of fertilisation; thus, a 5-day old embryo is a living soul. This definition came in 1869 when Pope Pius IX declared that an embryo bears full human status from point of fertilisation, superseding the medieval Church belief that an embryo acquires a soul only when it is in a recognisable human form (Lachmann, 2001). It should be noted that the Pontifical Academy for Life (2000) released the ‘Declaration on the Production and the Scientific and Therapeutic Use of Human Embryonic Stem Cells’. This Declaration outlines the Catholic view of the moral status of embryonic life. As to whether it is moral to produce living human embryos to obtain stem cells, the Declaration states that the ‘human embryo from the moment of union of sperm and egg is a well defined identity…and thus cannot be considered as a simple mass of cells’.

Similarly, in an address at the International Congress on Organ Transplants, (Pope) John Paul II (2000) expressed that:

…insofar as they involve the manipulation and destruction of human embryos, are not morally acceptable, even when their proposed goal is good in itself…but rather make use of stem cells from adults…in order to respect the dignity of every human being even at embryonic stage.

The recent doctrine released by the Vatican titled Instruction Dignitas Personae that was endorsed by Pope Benedict in 2008 reiterates that using surplus embryos for
the purpose of treating diseases is unacceptable because embryos are treated as biological material resulting in destruction (Benedict, 2008, No 19).

However, there are some liberal Catholics in support of ESCR. Among others, a renowned ethicist, Farley (2000), representing liberal Catholics, argues that ESCR can be carried out to promote human well-being. Farley (2004) also asserts that official religious documents ‘leave open the question of the moment when the spiritual soul is infused’ as there are no Biblical verses which succinctly explains when ensoulment occurs. Other liberal Catholics, including Jean Porter and Christian Kummer, also appear to support ESCR (Reichhardt et al., 2004).

There is not much literature and resources deliberating in detail on the positions taken by Buddhists and Hindus on ESCR, if we were to compare with the writings by the Islamic global community. Even the religious testimonies presented at the United States National Bioethics Advisory Commission (NBAC, 2000) on ESCR, only covered the views of Islam, Catholicism, Judaism and other Christian denominations, but did not include representatives from the Buddhist and Hindu tradition.

This study therefore hopes to contribute towards knowledge building by exploring the perspectives of religious leaders on ethics of ESCR from the Buddhist, Hindu and Catholic traditions vis-à-vis use of surplus and research embryos.

2.2.3 Religious Influence in Ethical Discourse

This study attempts to explore the ethics of ESCR from the religious perspectives in Malaysia. At this point, it is important to justify why a study on religious perspectives is of paramount importance. This section outlines examples of
religious influence in public discourses, and also cites selected studies on religious perspectives.

In November 2012, there was a huge public outcry over the death of Savita Halappanavar (a female dentist of Indian origin) in Dublin, Ireland. The woman in the midst of miscarriage died of blood poisoning after she was refused abortion. It was reported that Ireland, predominantly a Catholic country could not resort to abortion. The woman who was neither Irish nor Catholic was miscarrying a few days but doctors refused to terminate the foetus, citing the presence of its heartbeat as a reason (*The Huffington Post*, 2012). This case stands as a testimony to what extent religions play a major role and influence in health policies and implementations.

In May 2013, in El Salvador, a country populated by mostly Catholics, a chronically-ill (diagnosed with lupus) pregnant woman with a malformed foetus lost her Supreme Court bid to have an abortion though it is a high-risk pregnancy. It was reported that the country’s Archbishop had requested the court not to allow the woman to have an abortion arguing that it would set precedence for more such requests. While feminist groups were outraged, Catholic organisations of that country praised the ruling (*The Telegraph*, 2013).

At this juncture, it is interesting to point out that the extent to which religious opinions influence regulation of embryo research may not be always in the form of objection. For instance, in Spain, the *Law on Biomedical Research (Law 14/2007)* allows for research on embryos for therapeutic purposes (*EuroStemCell*, 2012d). In a country with the majority of the population being Catholics, the law was passed ruling permissibility for the use of surplus embryos in stem cell research in Spain (Reichhardt, Cyranoski, & Schiermeier, 2004). That is worth mentioning as Catholics are against the very practice of IVF itself. In fact, Spain created its first public stem cell bank in 2004.
which then sparked debate over its regulation on the use of human embryos (*The New York Times*, 2004).

Walters (2004) in his paper on intercultural perspective surveyed the public policies for ESCR in the main regions of the world including Asia Pacific, Europe, Middle East, Australia and North America. Reviewing the position of the religious traditions pertaining to ESCR, Walters noted that although there is a ‘centralised authority’ in Catholicism from the Vatican, there are points of disagreement between the official church teaching and the dissenting views by liberal Catholic theologians. On the other hand, in the absence of a central authority, the religious texts of the Hindus and Buddhists are interpreted by religious leaders resulting into a wide range of viewpoints.

Meanwhile, Hug (2006) in her paper presented the main arguments in favour of and against ESCR and the views of the pre-dominant religions on the use of human embryos in regenerative medicine. However, the paper does not focus on the ethical standpoints of every religion as it only presents a general review on the religious perspective on the moral status of embryo. It is also not supported by specific case study or interviews with religious authorities.

A book chapter by Jafari, Elahi, Ozyurt, and Wrigley (2008) surveys the major world religions, in attempt to address the question ‘when does life begin’ and how these viewpoints affect research on embryonic stem cells. The chapter broadens the discussion to include a worldwide religious perspective on ESCR. It only provides a general idea about the varying religious belief systems and the perceptions on the moral status of an embryo. Hence, it is the aim of this study to extend the discussion to address the ethical issues associated to ESCR in a multi-religious country like Malaysia, with regards to the use of surplus and research embryos.
There is a paper by Knowles (2009) in a forum in *Stem Cell Network*, which surveys the standpoints of the major world religions pertaining to stem cell research. The forum does not encompass surveys on diverse opinions within one religious tradition, and neither it is supported by any findings. It is mainly based on the testimonies presented in the United States NBAC in 2000. Another report is the one by Frazzetto (2004) in the *European Molecular Biology Organisation* (EMBO) presenting in general the varying religious beliefs on controversial issues such as cloning and stem cell research. A contentious issue like ESCR has also generated discussions in the non-partisan forum on *Religion and Public Life*, which presents to its readers in the United States on the general religious positions on stem cell research (Pew Research Centre, 2008), but does not specifically relate to any study with regards to the use of surplus and research embryos.

Significant work has also been done in Asia and beyond on the religious perspectives on organ transplantation (Tai, 2009), on human cloning (Roetz, 2006; Campbell, 1997), and on genetic engineering (Pfleiderer, Brahier, & Lindpaintner, 2010).

Religious concerns are also significant in Malaysia. In an editorial write-up, Macer (2009) related his experiences in Malaysia with a number of religious and ethnic groups. Macer noted the great diversity in terms of values and principles in decision-making within these classifications (denominations). The importance of multi-religious participation in ethical deliberation has been noted as particularly important in Malaysia, by Fujiki and Macer (1998), who opined that all communities in multi-cultural Malaysia would do well to understand bioethical issues so as to participate fully in developing suitable ethical guidelines.

For instance, attention to a multitude of opinions of various faith groups in Malaysia on the ethics of organ transplant has been addressed (Robson, Razack, &
Dublin, 2010). It was concluded that addressing the religious perspectives is important so that people will be more willing to donate organs to others, first to those similar to themselves, and then to strangers at large. In 2011, the Ministry of Health of Malaysia in collaboration with Department of Islamic Development released a report deliberating on Organ Transplantation from the Islamic perspective (MOH, 2011). The permissibility of organ transplantation in Malaysia was discussed in the report. Accordingly, Islam encourages organ donation which in turn inculcates altruism in individuals and society as a whole, in offering a helping hand to mankind regardless of race and religion. In a public forum on “Organ donation from an Islamic perspective” held in Putrajaya, Malaysia in October 2014, the Deputy Health Minister said that fear, lack of understanding and religious concerns are the main reasons among the Malays for not coming forward to be organ donors. The low rate of organ donation is due to the fact that the potential donors are uncertain as to whether their religion allows organ donation (theSun Daily, 2014).

Malaysia is made up of 61.3% Muslims, 19.8% Buddhists, 9.2% Christians and 6.3% Hindus (Department of Statistics Malaysia, 2010). Although Buddhism does not fall into the conventional definition of a religion that believes in an all-encompassing Creator; it is one of the dominant faiths practiced in Malaysia and for this study, Buddhism is regarded as a religion. There are many denominations within the Christian faith in Malaysia such as Roman Catholic, Methodist, Anglican, Lutheran, and Presbyterian. This study has elected to explore the Catholic perspective, since it is the major denomination in Malaysia, with a structured institution and documentation. In 2010, Catholics surpassed one million, covering 3% of total population and 40% of the 2.2 million Christians in Malaysia (Herald, 2012).

Religions play a major role in formulating policies and framework. At present, the National Fatwa Council has issued its decision regarding ESCR (Department of
Islamic Development Malaysia, 2005) (refer Appendix A and B). The input from other religions has not been officially documented. Thus, it has become important that a study is undertaken in the Malaysian context to study the ethical perception of Buddhist, Hindu and Catholic leaders pertaining to ESCR.

To date, Foong (2011) has written a paper on multi-faith perspectives on ESCR. The paper included excerpts of interviews of religious leaders and scholars from the different faiths in Malaysia (generally one representative from every faith), but the responses from the interviews were not analysed in-depth according to themes. Foong also does not extend into ethical deliberations on the use of surplus and research embryos, and does not employ conceptual framework, which are developed in this study. My study therefore deals not only with the controversy surrounding ESCR whereby embryos are inadvertently destroyed during research, but it also carries ethical insights on the use of surplus and research embryos from the perspectives of religious leaders in a multi-faith society.

Hence, my study which aims to gain perspectives of the Buddhist, Hindu and Catholic leaders with regards to ESCR in Malaysia is more comprehensive.

2.2.4 Studies on Public Perception

This study aims at gathering the perception of the religious representatives on ESCR. Hence, it has become important for the researcher to look at some examples of studies on public perception – on the research method, targeted samples, and findings of those studies. Issues concerning reproductive techniques and human genetic research have spurred anxiety among both the religious groups and the public in general, throughout the world. Hence, issues related to ethical and moral implications of
emerging biological and medical discoveries are constantly addressed through public perception studies.

For instance, a survey of European public perception of biotechnology (Gaskell et al., 2000) shows that public are increasingly opposing genetically modified (GM) food but remain supportive of medical biotechnology applications. Despite the opposition to GM food, public perception for medical biotechnologies such as genetic testing and pharmaceuticals, and environmental biotechnologies such as bioremediation are positive. The survey which studied the level of support and opposition for seven applications of biotechnology (genetic testing, medicine, bioremediation, clone human cells, clone animals, GM food, GM crops) across countries in Europe, gave insights about public concerns pertaining to moral and ethical dimensions of biotechnology applications.

Besides that, ethical issues from intercultural perspective are also addressed. For instance, parental experiences and challenges coping with critically ill babies in neonatal intensive care unit were studied from the cross-cultural perspective between France and United States settings (Orfali & Gordon, 2004). The study provides insights about parents’ perception and decision-making given their cultural and institutional differences.

Evolving reproductive technologies also result in ethical debates. A cross-sectional survey was conducted to study the attitudes of patients, healthcare professionals and ethicists towards ESCR and donation of gametes in Germany (Krones et al., 2006). The survey showed that infertility couples recorded positive attitudes towards donation and research using surplus embryos, whereas the healthcare professionals and ethicists are skeptical about the research involving destruction of embryos.
A public perception study was conducted to explore to what extent religious beliefs impact lay beliefs about causes of, and treatments for mental illness. Cinnirella and Loewenthall (1999) conducted the study via in-depth interviews in the United Kingdom with different religious groups comprising White Christians, Pakistani Muslims, Indian Hindus, Orthodox Jewish and Afro-Caribbean Christians. Prayer is an effective way of coping with mental illness among Afro-Caribbean Christians and Pakistani Muslim groups. There is also a fear among respondents of being misunderstood and hence the preference for a health professional from the same race or religion.

On the local front, public perception on matters concerning public health issues is not neglected. For instance, the Federation of Reproductive Health Associations Malaysia (2011) studied the issue of safe abortions by seeking the knowledge and perception of medical students and medical officers. Amin et al. (2011b) studied the level of knowledge and awareness on biotechnology by surveying the ethical perception of various stakeholders, including religious experts from the Islam, Buddhist, Hindu and Christian traditions. However, the paper did not include background information on the authority and affiliation of the religious experts, which this study provides.

In conclusion, public perception on emerging biotechnology and biomedical research, such as ESCR, is important to be addressed to facilitate implementation of policies.
Table 2.1: Summary of significant concepts from the literature review

<table>
<thead>
<tr>
<th>Concept</th>
<th>Author(s)</th>
<th>Description</th>
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<tbody>
<tr>
<td>MORAL STATUS OF EMBRYO</td>
<td>Green (2002)</td>
<td>Fertilisation is a process rather than an event and therefore the determination of significant point within these processes involve choice on our part</td>
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<td></td>
<td>George and Gómez-Lobo (2005)</td>
<td>Since human beings are intrinsically valuable deserving full moral respect, it follows the same way from the point they come into a being, and that also includes early embryonic live coming into existence from fusion of gametes, and as such they should be accorded the full moral status and respect ascribed to inviolability of any other human beings.</td>
</tr>
<tr>
<td></td>
<td>DeGrazia (2007)</td>
<td>Inviolability referring to moral respect, is more of an appeal for the ‘necessity of early moral protection’. One cannot resolve the issue as to whether early embryo has moral status by referring to present status of inviolability in a simple reductionist manner, because the present entitlement not to be killed does not entail past entitlement in the same manner.</td>
</tr>
<tr>
<td>(i) Moral respect for early life</td>
<td>Ruiz-Canela (2002)</td>
<td>Respect for human beings should not be based on ‘developmental view’ but must be same regardless of the developmental stages.</td>
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<td></td>
<td>Hall (2004)</td>
<td>An early human embryo prior to implantation does not have same moral status as a human person because it lacks morally relevant capacities.</td>
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<td></td>
<td>Fischbach and Fischbach (2004)</td>
<td>Implantation of embryo in the uterine wall marks the beginning of life because the embryo is now defined as an individual as it has past the stage of possible twinning. Until day 14 of fertilisation, the embryo has no nervous system and cannot sense pain, the embryos cannot be considered sensate before day 14. It is reasonable to consider the phase when the possibility of sensation first exists as beginning of human life.</td>
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</table>
(ii) Sentience, personhood and potentiality of early embryos

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<tr>
<th>Concept</th>
<th>Author(s)</th>
<th>Description</th>
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<tbody>
<tr>
<td>(ii)</td>
<td>Warnock (1984)</td>
<td>The formation of primitive streak at 14 days of gestation is taken as one reference point in development of human individual.</td>
</tr>
<tr>
<td></td>
<td>Warren (1997)</td>
<td>Sentience is a being’s capacity to experience pleasure and pain which provides reason for recognising moral obligations not to kill it, but it is not regarded as a sufficient condition for full moral status</td>
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<tr>
<td></td>
<td>UNESCO IBC (2001)</td>
<td>Since there is no possibility of implantation and the embryo has no potential to develop into a human being, it is then ethically defensible to use these embryos for therapeutic research purposes</td>
</tr>
<tr>
<td></td>
<td>United States President’s Council on Bioethics (2002)</td>
<td>The possibility of twinning and moral significance of implantation are sound moral reasons in not to regard early embryo in the first 14 days as moral equivalent of a human person.</td>
</tr>
<tr>
<td></td>
<td>George and Gómez-Lobo (2005)</td>
<td>One need not have to be ‘conscious, reasoning and deliberating’ in order to earn full moral respect</td>
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</table>

(iii) Moral questions on use of surplus and research embryos

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<thead>
<tr>
<th>Concept</th>
<th>Author(s)</th>
<th>Description</th>
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<tbody>
<tr>
<td>(iii)</td>
<td>Warnock (1984)</td>
<td>Surplus embryos may be used as subjects for research</td>
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<tr>
<td></td>
<td>Steinbock (2000)</td>
<td>There is no moral difference between utilising surplus embryos or research embryos for stem cell research.</td>
</tr>
<tr>
<td></td>
<td>Outka (2002)</td>
<td>‘Nothing is lost’ principle outlines two conditions: (1) the innocent will die in any case and (2) another innocent life can be saved. Employing surplus embryos in research for therapeutic purposes is in line with the principle.</td>
</tr>
</tbody>
</table>
| | Steinbock (2006) | As much as creation and destruction of surplus embryos which is a very much part of IVF is justified for reproduction purposes, so is the creation and destruction of research embryos aimed to improve people’s health. Neither the creation and use of surplus embryos nor research embryos ‘contravene...
Manninen (2007) • Proper respect for surplus embryos is manifested by using them in research which allows their existence to have [positive] impact to the world, rather than just to discard them.

Table 2.1, continued

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<thead>
<tr>
<th>Concept</th>
<th>Author(s)</th>
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<tr>
<td><strong>ISLAMIC PERSPECTIVES AND POSITIONS ON ESCR</strong></td>
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<tr>
<td>(i) Knowledge- seeking research benefit mankind</td>
<td>Sachedina (2000)</td>
<td>• It is an act of faith to carry out ESCR if it is for the purpose of maintaining health</td>
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<td></td>
<td>Weckerly (2002)</td>
<td>• Islam’s obligation to seek knowledge is the reason for many Islamic scholars to support stem cell research</td>
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<td></td>
<td>Siddiqi (2002)</td>
<td>• If ESCR can relieve suffering of people, then it is denoted as ‘obligatory’ under <em>Fardu Kifayah</em> [societally requisite knowledge]</td>
</tr>
<tr>
<td></td>
<td>Rispler-Chaim (2006)</td>
<td>• The use of surplus embryos in research instead of being discarded for the purpose of benefiting the society is in accordance to principle of <em>maslaha</em> (public good)</td>
</tr>
<tr>
<td></td>
<td>Ilkilic and Ertin (2010)</td>
<td>• Although ESCR does not immediately results into cure of diseases, the research itself may contribute towards a better understanding of body functions at cellular level which is valued as knowledge-seeking</td>
</tr>
<tr>
<td>(ii) Sanctity of embryonic life</td>
<td>Siddiqi (2002)</td>
<td>• Shariah makes distinction between actual and potential life, whereby a fertilised ovum in the petri dish has potential to grow as human being but it cannot survive as a human being as it is not in its natural environment - woman’s womb</td>
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<td></td>
<td>Fadel (2012)</td>
<td>• Ensoulment which is the breathing of spirit into embryo, is what differentiates biological life from human life. • Only after ensoulement, the embryo acquires personhood</td>
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<td></td>
<td>Ilkilic and Ertin (2010)</td>
<td>• ESCR using human embryos is ethically permissible viewed from the vantage point of ensoulment</td>
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<tr>
<td>Concept</td>
<td>Author(s)</td>
<td>Description</td>
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<tr>
<td>PERSPECTIVES OF OTHER MAJOR RELIGIONS ON ESCR</td>
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<td></td>
</tr>
<tr>
<td>(i) Buddhism</td>
<td>Keown (2004)</td>
<td>• Buddhism does not support research on human embryos that entails the destruction of human life.</td>
</tr>
<tr>
<td></td>
<td>Promta (2004)</td>
<td>• The use of embryonic stem cells in research, may be viewed as “socially” moral if it is intended to cure the disease of a human person, but contradicts with Buddhist “personal” ethics, whereby destroying the embryo is a violation of its right to life.</td>
</tr>
<tr>
<td></td>
<td>Singapore BAC (2002)</td>
<td>• Buddhist Federation supports utilising non-sentient pre-implantation embryos in ESCR which has the intention of helping humankind</td>
</tr>
<tr>
<td>(ii) Hinduism</td>
<td>Tyagananda (2002)</td>
<td>• Destruction of life is held as bad karma unless the act is unavoidable and carried out for the ‘greater good’ of humanity</td>
</tr>
<tr>
<td></td>
<td>Singapore BAC (2002)</td>
<td>• Hindu Endowment Board allows the use of stem cells from 5-day old embryos to establish stem cell cultured lines, aimed at protecting life and finding cures for diseases, while making it clear that killing a foetus is a sinful act</td>
</tr>
<tr>
<td>(iii) Catholicism</td>
<td>Pontifical Academy for Life (2000)</td>
<td>• The human embryo is a well-defined identity from the moment sperm fuses with ovum.</td>
</tr>
<tr>
<td></td>
<td>John Paul II (2000)</td>
<td>• Manipulation and destruction of human embryos is not acceptable even if the proposed goal is good.</td>
</tr>
<tr>
<td></td>
<td>Benedict (2008)</td>
<td>• Using surplus embryos for purpose of treating diseases is unacceptable because embryos are treated as biological material resulting into destruction.</td>
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</tbody>
</table>
2.3 Critical Evaluation of Literature

Most of the debates pertaining to ethics of human embryo research are centred in Western countries, such as the United States, and the United Kingdom which are secular in nature and, therefore, not applicable to country like Malaysia, which is rich in religious and cultural diversity. The current discussions are framed within the context of the West and the views debated in the literature on ethics of ESCR revolve around moral status, and criterions for moral status such as personhood, sentience and potentiality of embryo. However, it is important to note that other issues are emerging or becoming significantly important in ethical discourse surrounding hESC research, shifting the focus of ethical debate from moral status of embryo to other ethical concerns such as motivation and potential of research itself. There is limited literature concerning the ethical conundrum of ESCR in Asian countries like Malaysia, a nation which is firmly grounded on religious reasoning.

The debate on the moral status of human embryo in Western literature is also diverse. Accordingly, at one end, the argument is that the human embryo has moral status from moment of conception and, thus, worthy of protection. Therefore, research on a 5-day old embryo which entails its destruction is morally impermissible. Then, the middle-way approach is that the 5-day old embryo has special moral status but it lacks the moral capacities of a human being such as consciousness, and ability to sense pain. The moral status is said to develop gradually with the biological development of the embryo. Then, at the other end of the spectrum is the argument that a 5-day old embryo comprising around hundred cells is just a collection of cells and lacks moral status. It is this moral controversy that makes the ethical discourse surrounding ESCR both interesting and challenging.
Then, there is the 14-day rule commonly addressed in Western literature, that a human embryo is worthy of protection after day-14 of fertilisation because (i) the end of twinning around day 14 marks individualisation, and (ii) formation of nervous system around day 14 marks the possibility of first sensation which is a landmark in definition of life.

Reflecting on these interpretations on moral status of embryo, it is worth asking whether is it possible to maintain respect to surplus embryos while using them in ESCR, which otherwise will be discarded. Another point to ponder is whether it is justified to deliberately create research embryos solely for ESCR purposes. Ultimately, what needs to be addressed is whether there is any moral difference between utilising surplus and research embryos in ESCR. Fundamentally, the need to conduct research on human embryos regardless of whether it is surplus or research embryos, for the therapeutic potentials of offering treatments to various diseases, also need to addressed from the Malaysian context.

In a pluralistic society like Malaysia, the interpretations on the moral status of embryo, vary according to the religious views of the multi-faith groups. The question as to when the human embryo warrants respect and protection compel us to question when human life begins. The basis of religious guidance on when human life begins essentially revolves around the notion of ensoulment in Islam, Catholicism and Hinduism. Buddhism does not believe in the concept of an eternal soul, but refers to ‘consciousness’ energy. Diverse views exist within and among religious traditions on when life begins. This further resulted in varying viewpoints regarding the positions taken by those religions on permissibility of ESCR.

From the vantage point of sanctity of life, Muslim scholars generally agree that embryonic life is worthy of respect but lacks the full sanctity before ensoulment. Islamic position on ESCR is that using surplus embryos is allowed but creating and
employing research embryos is strictly prohibited. Stem cell research is also viewed as a knowledge-seeking endeavour to save lives which is encouraged in Islam for the public good. The perspectives of other main religions in Malaysia, in a similar vein, that is from the vantage point of (I) sanctity of life, and (II) research is a knowledge-seeking endeavour, need to be explored. Past researchers also have not studied the ethics of ESCR from the aforementioned vantage points. None are similar or even close to the scope that I have chosen to embark from.

At present, there is no legislation in Malaysia on matters concerning ESCR other than the Guidelines on Stem Cell Research and Therapy which is based on fatwa ruling from the Islamic council (MOH, 2009a). The input from other religions is not addressed and is sorely missing in the guidelines. Thus, it has become important to explore the perspectives of the religious groups on ethics of ESCR in Malaysia to give a comprehensive, dispassionate picture.

Acknowledging the gap, this study attempts to study the ethics of ESCR according to the religious perspectives of the major religions in Malaysia, namely Buddhism, Hinduism and Catholicism, that is to identify what are the motivational factors behind their ethical reasoning in a hope to contribute towards knowledge building in the ethical discourse of ESCR from a multi-cultural and multi-religious context.

Most studies in Malaysia are on the clinical and scientific applications of stem cells (Tan et al., 2013; Fadilah & Aqilah, 2012; Maqbool, Vidyadaran, George, & Ramasamy, 2011; Nur Fariha, Chua, Tan, Tan & Hayati, 2011; Gan et al., 2008).

Foong (2012b) made a comparative analysis of the medico-legal and ethical issues associated with ESCR in Australia and Malaysia. Foong, from the law school, evaluates the existing regulatory framework in Malaysia and recommends the adoption of a more effective regulatory model. Foong acknowledges the difficulty in regulating
stem cell research in a multi-religious country like Malaysia with varying religious perspectives. Foong’s study however concentrates on recommending a suitable regulatory framework, and only a small chapter is dedicated in discussing the religious views on ESCR.

Another point to note is that past studies look within a single religious perspective. To my best knowledge, no detailed study has been made pertaining to ethics of ESCR in Malaysia, focusing on multi-faith insights with regards to the use of surplus and research embryos. This study aims to explore the thinking of religious leaders on the moral status of human embryos where the use of surplus embryos is expected to carry a different moral connotation from the use of research embryos.

Moral status accorded to human embryo based on one’s understanding about human life, and the ethical debate is very much influenced by religious beliefs, making it difficult to attain consensus (Isasi, Knoppers, Singer, & Daar, 2004). The varying ethical arguments on the status of human embryo and conception of life make it hardly possible for a consensus between religions (Frazzetto, 2004), with regards to ESCR. In other words, the diverse religious views make it highly controversial to attain consensus.

With that caveat in mind, the final part of this study aims to explore the responses of the religious leaders in Malaysia on reaching a consensus with regards to ESCR, the challenges in attaining a consensus, and their recommendations on this contentious issue.
2.4 Conceptual Framework

Based on the conceptual ideas from the summary table 2.1 on significant review of literature, and evaluation of literature in Section 2.3, I formulated a conceptual framework which stands as a basic guideline in conducting interviews and collecting data.

A conceptual framework is diagrammatic, showing how the researcher wishes to go on with the study.

Specific values or domain of inquiry were identified in the conceptual framework. The two domains of inquiry or values were identified from Islamic literature namely (I) sanctity of life, and (II) research is a knowledge-seeking endeavour - serve as a guideline and as a starting point to formulate the interview questions, and to explore whether these values are also the concerns of the religious leaders from the Buddhist, Hindu and Catholic tradition, or whether there are other overriding concerns. This study extends from the Islamic ruling and extends local ethical deliberations to include the perspectives of Buddhist, Hindu and Catholic groups in Malaysia.

Questions were developed to solicit a clear understanding and views from the religious leaders on ESCR in regards to the use of (i) surplus embryos and (ii) research embryos.

See next page for the conceptual framework.