Termination of pregnancy and the over 30s: What are trends in contraception use 1996-2006?

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Applied for ethics approval’s from the respective institutions. Collected ten years of data from two termination of pregnancy services in Adelaide and entered into SPSSv12 checking for missing data and discrepancies. Undertook data analysis, wrote the manuscript for publication.

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Abstract

Background
There is a shift in fertility patterns with more women commencing childbearing over 30 years of age. Little is known about trends in contraception use by women in this age group seeking a termination of pregnancy. This research presents a trend analyses to determine if there were significant changes in trends in contraception use pre and post termination of pregnancy for women over 30 years of age from 1996-2006 in South Australia.

Methods
Data was collected from 1996-2006, from a pregnancy termination service in South Australia, from women over 30 years. Data, entered into SPSS V12, were examined using simple linear regression.

Results
At the time of conception, the majority of women reported using some form of contraception. There was no significant change in nil contraception use and was a significant decline in women using natural family planning methods. Post-operatively, there was a significant decline in hormone methods, but no significant changes in barrier, family planning or nil contraception use.

Conclusions
The majority of women over 30 years of age used contraception at the time of conception prior to and post-operatively of having a termination of pregnancy over the ten year period of the study. Health promotion activities need to be developed to cater for this age group taking into consideration changing fertility patterns.
Background
Current societal debates on the many issues that surround termination of pregnancy is often not based on current research, and representative information about women who have pregnancy terminations is limited (Jones, R K, Darroch, J E & Henshaw, S K 2002). There is some evidence of an increase in terminations women over the age of 30 years in South Australia (Abortion reporting committee 2007). However, little is known locally or even globally about trends in contraception use of women in this age group (Abigail & Power 2008). With fertility patterns and characteristics of women changing it is important that research is focused on addressing deficits in knowledge (Finer et al. 2005). Accurate information can help policy makers and family planning providers tailor programs specific to different reproductive stages of women’s lives as well as dispel myths associated with pregnancy terminations (Jones, R K, Darroch, J E & Henshaw, S K 2002). Therefore, the purpose of this research was to present a trend analyses to determine if there were significant changes in trends in contraception use for women over 30 years of age seeking pregnancy terminations for less than 12 weeks gestation from 1996 to 2006 in a state-wide facility in South Australia.

The benefits of historical type studies, such as a trend study, include enhanced precision of findings and provision of statistically significant information for assessing clinical and public health interventions (NHMRC 2000). Trend analysis allows data to be aggregated over equal intervals in time enabling current estimates to be placed into a more meaningful historical perspective (Chatfield 1975). This enables description of the current state of play in relation to earlier outcomes (Trewin 2003). A limitation of this type of study, however, is the lack of identification of turning points in a series which occur when the direction of the underlying level of the series...
changes during the year (Australian Bureau of Statistics 2006). However, as this research aims only to describe a trend, a trend analysis is suitable (Chatfield 1975). The contribution that our research will provide to knowledge in the area of unwanted pregnancies will be of value to local, regional, state and national services. This research will support women’s health workers and interested bodies in developing and providing best practice service responses. It also will help guide community health promotion programs to address population health needs from an evidence-based perspective.

The shift in fertility age patterns and the impact of the ‘baby-boom’ population of women in developed countries is attributed to the increase in the mean age of women commencing childbearing (Hamilton & Ventura 2006). According to a recent trend analysis in Europe (Lutz 2006), changing fertility patterns have not identified any specific main reason for the changing pattern, although there are a number of strong social and economic forces exerting pressure towards later childbearing. Women older than 35 years chose pregnancy termination mainly due to work situations, the relationship with their partner (if the relationship was less than five years or if unstable), if the woman was single, or had a high school education and whose partner was highly educated (Sihvo et al. 2003).

With the changing trends in fertility patterns comes the possibility of changing trends in contraception patterns. A worldwide literature search on 41 databases such as CINHAL, ProQuest, and Medline (OVID) using keywords such as abortion, termination of pregnancy, unwanted pregnancy, trends, contraception, time-series, repeat, and epidemiology, from 1995-2006 was conducted. We found few trend
studies greater than five years duration which have addressed the issue of contraception use at the time of conception in relation to a termination of pregnancy, and choices made post-operatively of a termination of pregnancy.

An Australian study in 1995 (Hudson & Hawkins 1995) examined contraceptive practices prior to the termination of pregnancy rather than at the time of conception, and the authors found that 41.5% of all women engaged in unprotected intercourse and 58.5% experienced contraceptive failure. Hudson and Hawkins (Hudson & Hawkins 1995) found that during the period 1988-1993 use of barrier methods increased, hormonal methods remained constant, and that there were no significant changes in natural methods or usage of intrauterine devices.

A trend study from 1977-1992, in three South American countries (Singh & Sedgh 1997) examined the correlation between contraception and termination of pregnancy. They found that the termination of pregnancy ratio per 100 births was positively associated with contraceptive use over time in nearly every region of each country due to changing fertility patterns. This study, however, did not look directly at contraception use at the time of conception prior to a termination of pregnancy, rather it examined the correlation between termination of pregnancy and general contraceptive use.

A New Zealand trend study from 1995-2002 (Goodyear-Smith & Arroll 2003) examined contraception before a termination of pregnancy and found a decline in contraception use pre-conception was attributed to increases in the Asian immigrant population in New Zealand over the last decade. A five year study of women in
Turkey in 1993 and 1998 examined contraceptive practices prior to a termination of pregnancy which were grouped as traditional, modern, nil and uncertain (Senlet et al. 2001). They found that the majority of pregnancy terminations were preceded by contraceptive use and there was a decline in the proportions of contraceptive failure over time. None of these studies specifically examined women over 30 years of age.

One trend study from 1988 to 1993 in Australia, which examined women’s post-operative contraception choices following a termination of pregnancy (Hudson & Hawkins 1995) found that the majority of women (82% of all women), preferred hormonal contraception. Women older than 26 years of age, however, tended to continue using barrier methods more frequently than women under 25 years of age. One other trend study (Goodyear-Smith & Arroll 2003), compared post-operative contraception choices in 1995, 1999 and 2002 and found an increasing trend for condom use.

There is minimal worldwide research available on trend studies on contraception use at the time of conception or post-operative of a termination of pregnancy.

Additionally, there were no trend studies worldwide on contraception use which specifically examined women over the age of 30 years in relation to pregnancy terminations.

**Methods**

A trend design was chosen to evaluate and describe changes in trends in women over 30 years of age in relation to contraception use at the time of conception in relation to a termination of pregnancy and post–operative of a termination of pregnancy.
Data was collected from a free-standing state-wide pregnancy termination service provider in Adelaide, South Australia. On average the service provides approximately 2400 surgical termination of pregnancy procedures on women of all reproductive ages who are less than 12 weeks gestation per year. Although this service is not the sole provider of services in South Australia, it does provide the majority of pregnancy terminations in the metropolitan area of Adelaide where 94% of all pregnancy terminations in South Australia are performed (Abortion reporting committee 2007).

The service providers’ database was accessed for the years 1996 to 2006 for women over the age of 30 years with a gestation of less than 12 weeks. Every 6th case was systematically selected from the database giving a total of 965 entries. A power analysis based on a simple linear regression over the ten year period indicated a power of 0.93 (Lenth 2006). All data used was permanently de-identified.

Ethics approval was granted by the Flinders University Adelaide Social and Behavioural Research Committee, and the service provider’s ethics committee.

Data was collected on pre-admission self-administered questionnaires and admission forms for each client attending the service. The standardised collection forms remained consistent for the whole ten year period. The database was not originally set up for research purposes, however as technology developed over the period of the study, it became evident that a rich source of epidemiological information was being gathered, allowing for investigation of features on the database (NHMRC, Australian Research Council & Australian Vice-Chancellor's Committee 2006). Data which included age, contraception used at time of conception and contraception choices the
client left the service with were entered into a specific database. The data was collected by trained nurses and entered into the database by trained clerical staff.

We grouped the contraception types into four categories: nil, barrier, natural family planning and hormone methods (Table 1). The hormone intrauterine device was included in the category of barrier methods with other intrauterine devices for the last three years of the trend analysis. This was due to its introduction into Australia at that time and was not separately categorised on the database. This may skew the results slightly. The de-identified data was transferred to SPSS V12, which was then weighted to enable comparison to be made for each of the ten years of the study. This meant that the average weighted mean for each of the ten years was used to assess trend. The trend data was examined using simple linear regression. Data were initially tested for normality (one-sample Kolmogorov-Smirnov test, normal probability plot) and autocorrelation (Durbin-Watson test) and were found to meet the assumptions of a linear regression.

**Results**

**At the time of conception**

Overall, 66.18% of women over the age of 30 years used some form of contraception at the time of conception (Table 2). There were no statistically significant changes over the ten year period for most of the contraceptive methods examined. However, in 2005/06 there was a sharp rise from 22.4% to 52.7% of women reporting nil use of contraception. This indicates that over half of the women presenting in 2005/06 did not use any form of contraception at the time of conception (Figure 1). Reasons for this are unknown.
There was a highly significant decline in the percentage of women reporting using natural family planning methods at the time of conception (Table 3). It, however, needs to be considered that few women used this method over the ten year period.

**Post-operative contraception choices**

Overall, the average percentage of women over 20 years of age choosing hormone methods was 53% (SD ±4.43) (Table 2). However, we found a highly significant decline in the percentage of women choosing these methods post-operatively (Table 3). No significant changes in contraceptive choices of barrier, nil contraception or natural family planning methods post-operative of the women’s termination of pregnancy were found (Table 3, Figure 2). Natural family planning method of contraception was not popular overall, with only 1.67% (SD ±0.34) of women choosing this method on average (Table 2).

**Discussion**

The media in Australia often reports on male politicians who state that women are irresponsible with contraception usage, and that pregnancy terminations are used as a form of contraception. However, these comments are not based on research but on personal morals (Allison 2006). Women may use more than one type of contraceptive, such as oral contraception and condoms, at the time of conception and still experience contraceptive failure and an unwanted pregnancy (Esacove & Andringa 2002). The collection of this research data on contraceptive methods at the time of conception was limited to the primary method rather than all types of contraceptive methods used at the time of conception, which is a limitation of this study. However, research in the USA reported in 2005 that only a small percentage of women used dual methods
(Sangi-Haghpeykar, Posner & Poindexter III 2005). It is unknown whether this is the same for women in South Australia and future studies could explore this further.

Our research did not compare trends with other age groups of women such as teenagers or women in their 20s in South Australia. Further research could examine whether the trends identified only occurred in the over 30 age group in South Australia or whether there are similar trends elsewhere. This information would have implications for tailoring of health promotion programs to specific age groups.

Overall, our research found that the majority of women over 30 years of age used contraception at the time of conception in relation to a termination of pregnancy at the health service in South Australia. However, previous research in the USA found over-reporting of compliance with contraceptive regimes by some women (Potter 1996). Data collection for our research was conducted in a private and personal setting where a rapport with the woman was developed. Research shows that reporting is more likely to be accurate in this situation (Smith, Alder & Tschann 1999). Additionally, an Australian study found that older women were more likely to discuss fertility issues due to their confidence of maturity (Mills & Barclay 2006). We believe that our research is accurate, but acknowledge that there may have been a small number of women who may not have reported truthfully. Our research dispels the myth that women over 30 years of age in South Australia are not using contraception at the time of conception. Further research could identify if this was also the situation for other states of Australia and other countries.
During the study period new contraceptives were introduced into Australia providing women with greater choice. The specific emergency contraceptive pill became available by prescription in 2002, and in 2004 became available over the counter in pharmacies (Allison 2006). The three year hormone implant became available in May 2001 on prescription making it an affordable contraceptive choice (FPA Health 2003). A hormone intrauterine device which lasts for five years, was made available on the Pharmaceutical Benefits Scheme, from April 2003, and low-dose oral contraceptive pills became available in December 1998 (Campion 2006; Foran 2003).

All these new contraceptives are hormone based, and hence even though they have been available for a number of years during the study period, their impact has not significantly altered women’s choices in the type of contraception chosen at the time of conception. Further trend research may reveal changing patterns of contraceptive use as additional forms of contraception become available in Australia.

Use of hormone methods immediately after a termination of pregnancy have declined significantly over the ten year period examined. Further research is warranted to explore why women are not utilizing this more reliable form of contraception. The research may help explain why there was such a decrease in the percentage of women choosing hormone methods in 2005/06, and whether this was a continuing trend or not. A Cochrane review by Halpern and colleagues (Halpern et al. 2006), stated hormone contraceptives are among the most popular reversible contraception used worldwide, however, typical use results in much lower effectiveness which reflects difficulties with adherence to regimes and slow rates of long term continuation. Research in the USA in 2000-2001, found that women aged 30 years or older were
more likely than any other age group to have used methods other than the pill or
condoms, with most using less reliable methods (Jones, R K, Darroch, J E &
Henshaw, S K 2002). Further research could explore knowledge levels as well as why
and how women in the older age groups make their decisions regarding contraception,
particularly in regards to their experiences of a termination of pregnancy. An
understanding of the issues may raise issues such as access to contraception
availability and education avenues.

With changing fertility patterns worldwide, the question of how to best address
education and target reproductive health promotion for women who are 30 years and
older needs to be considered. Women in the 30-50 years age group may work, already
have children, not want to allocate their time to contraception education when they
may have been contracepting for up to 15 years, or live in rural areas with minimal
access to education. Creative health promotion strategies need to be developed to
cater for this age group. Research is required to gain further knowledge which will
provide valuable information for health care planning purposes, educational needs and
dispel the many myths surrounding hormone contraceptive use.

**Conclusions**
Predominantly, women over 30 years of age used contraception at the time of
conception, prior to, as well as, post-operatively of having a termination of pregnancy.
However, contraception does fail and with the changing fertility patterns, policies and
health promotion activities need to be developed to reflect this. Further research is
warranted to examine contraceptive use in relation to pregnancy terminations to
investigate the wide range of issues surrounding this, including women’s experiences.
Understanding the reasons why women are making their decisions may give insight into areas such as the possible influence of myths surrounding contraception, relationship factors or the impact of changing fertility patterns.

Competing interests
Nil

Authors' contributions
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Figures

Figure 1 - Contraception use at the time of conception
Trends in contraception use at the time of conception for women over 30 years of age from 1996 to 2006.

Figure 2 - Contraception use post termination of pregnancy
Trends in contraception use post termination of pregnancy for women over 30 years of age from 1996 to 2006.

Tables

Table 1 - Definitions of contraception groups
Table 2 - Contraception mean averages
Table 3 - Results of linear regression analysis

Additional files

Additional file 1 – Raw data for figure 2
File name 20080326_additional table 1 for fig 1 raw data.doc
File format Microsoft Word Document
Title of data Raw data table for figure 1
Description of data Raw data table with percentage values for figure 1 – Contraception use at the time of conception
Additional file 2 – Raw data for figure 2
File name 20080326_additional table for fig 2 raw data.doc

File format Microsoft Word Document

Title of data Raw data for figure 2

Description of data Raw data table with percentage values for figure 2 – Contraception use post termination of pregnancy.