

Impact case study (REF3b)

<p>Institution: Queen's University Belfast</p>
<p>Unit of Assessment: 3B Allied Health Professions, Dentistry, Nursing and Pharmacy (Nursing and Midwifery)</p>
<p>Title of case study: Improving pregnancy outcomes for women with diabetes</p>
<p>1. Summary of the impact (indicative maximum 100 words) Pre-pregnancy care (PPC) significantly reduces the risk of poor pregnancy outcomes among women with diabetes. Yet, lack of awareness has resulted in poor participation, with two thirds of women receiving suboptimal PPC (CEMACH, 2007).</p> <p>An innovative preconception counselling resource (DVD/website) to inform women about PPC and improve pregnancy outcomes is embedded in routine care in Northern Ireland and beyond since 2010. The UK's first widely distributed multimedia preconception counselling resource for women with diabetes is already having a significant impact on pregnancy planning. In early evaluation results 76% of all pregnant women with diabetes in Northern Ireland reported receiving PPC.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>Women with diabetes are at increased risk of poor pregnancy outcomes, including pre-eclampsia and congenital malformations. The innovative research programme aimed at improving engagement with pre-pregnancy care (PPC) and improving pregnancy outcomes for women with diabetes has its roots in the Diabetes and Pre-eclampsia Intervention Trial (DAPIT), a Wellcome Trust funded UK multi-centre trial to establish if vitamins C and E reduce the risk of pre-eclampsia among women with type 1 diabetes.¹ The DAPIT trial coordinator/co-investigator, VA Holmes, joined the School as a lecturer (2007). Her work on DAPIT - alongside I Young, (School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast), DR McCance, (Belfast Health and Social Care Trust), M Maresh (Central Manchester NHS), D Pearson (Aberdeen Royal Infirmary) and J Walker, (West Lothian NHS) - has led to the largest contemporary database of pregnant women with type 1 diabetes in the UK.</p> <p>Emerging from this database a series of papers has reported on emerging biomarkers for pre-eclampsia risk prediction,^{2,3} highlighting the importance of optimal glycaemic control both before and during pregnancy for the reduction of the risk of the pregnancy complication pre-eclampsia.² The link between early optimal glycaemic control and pre-eclampsia risk confirms evidence associating PPC with reduced risks of adverse pregnancy outcome. Despite this, the majority of women with diabetes enter pregnancy unprepared, with two thirds of women in the Confidential Enquiry into Maternal and Child Health (CEMACH) report (2007) receiving suboptimal PPC.</p> <p>Subsequently, in 2008, Holmes led a five-year research programme grant-aided by Diabetes UK (£202,372). Its aim was to improve PPC for women with diabetes, ultimately by increasing awareness of the importance of PPC among women, by designing, developing, and evaluating a preconception counselling resource. The innovative study design combined both 'user' and multi-professional advisory groups to produce a pioneering and highly acceptable preconception counselling resource for women with diabetes. Holmes & Alderdice first established that lack of awareness among women regarding the importance of PPC is a major barrier to optimum pregnancy preparation.⁴ Focus groups with women with diabetes prior to the design of the resource also evaluated the knowledge and needs of women with diabetes with regard to reproductive health. The groups highlighted the need for women with diabetes, regardless of age, marital status or type of diabetes, to receive guidance about planning pregnancy in a motivating, positive and supportive manner.⁴ Resource development was achieved under the direction of a multidisciplinary team, with continuous input from the target audience (women with diabetes) using focus group</p>

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methodology. The researchers subsequently developed an innovative preconception counselling resource entitled “Women with Diabetes: things you need to know (but maybe don’t)” (DVD / website) in partnership with women with diabetes and healthcare professionals.⁵ Prior to its development no preconception counselling resources were available for women with diabetes in either the UK or Ireland. Evaluated among 97 women with diabetes, the resource has proved effective in increasing women’s knowledge and in enhancing their beliefs and attitudes to preventing an unplanned pregnancy and seeking PPC.⁶

3. References to the research (indicative maximum of six references)

1. McCance DR, **Holmes VA**, Maresh MJA, Patterson CC, Walker JD, Pearson DWM, Young IS on behalf of the DAPIT study group. Vitamins C and E for prevention of preeclampsia in women with type 1 diabetes (DAPIT): A randomized placebo-controlled trial. *The Lancet* 2010; 376: 259-266. (IF: 38.278)
2. **Holmes VA**, Young IS, Patterson CC, Pearson DWM, Walker JD, Maresh MJA, McCance DR, for the DAPIT study group. Optimal glycaemic control, pre-eclampsia & gestational hypertension in women with type 1 Diabetes in the DAPIT trial. *Diabetes Care* 2011; 34:1683-8. (IF: 8.087)
3. **Holmes VA**, Young IS, Patterson CP, Maresh MJA, Pearson DWM, Walker JD, McCance DR, for the Diabetes and Pre-eclampsia Study Group. The role of angiogenic and anti-angiogenic factors in the 2nd trimester in the prediction of pre-eclampsia in pregnancy women with type 1 diabetes mellitus. *Diabetes Care* 2013. Aug 6, *online ahead of print*. (IF: 8.087)
4. Spence M, **Alderdice FA**, Harper R, McCance DR, **Holmes VA**. An Exploration of Knowledge and Attitudes Related to Pre-pregnancy Care in Women With Diabetes. *Diabetic Medicine* 2010; 27:1385-91. (IF: 2.903)
5. Spence M, Harper R, McCance DR, **Alderdice F**, McKinley M, Hughes C, **Holmes VA**. “Women with Diabetes: Things You Need to Know (But Maybe Don’t!)”; the systematic development of an innovative DVD to raise awareness of preconception care. *European Diabetes Nursing*, 2013; 12: 7-12.
6. **Holmes VA**, Spence M, McCance DR, Patterson CC, Harper R, **Alderdice FA**. Evaluation of a DVD for Women with Diabetes: Impact on knowledge and attitudes to preconception care. *Diabetic Medicine* 2012; 29: 950-6. (IF: 2.903)

4. Details of the impact (indicative maximum 750 words)

This relatively recent programme of research is already impacting on the delivery of care to women with diabetes. The preconception counselling resource, launched in 2010, is the UK’s first widely distributed multimedia preconception counselling resource to be made available to women with diabetes and their healthcare teams. Ultimately, it is aimed at preventing unplanned pregnancy and preparing women with diabetes for pregnancy. All diabetes care teams at 15 hospitals within the five local Health and Social Care Trusts¹ and a substantial number of GP practices adopted the resource with some 5,000 DVDs distributed to women with diabetes of childbearing age in Northern Ireland. Consequently, the resource is now embedded in routine care throughout the region and is widely used as a preconception counselling tool. This programme of work has been awarded a prestigious UK Diabetes Quality in Care 2013 Award for ‘Best Improvement Programme for Pregnancy and Maternity’.

Early evaluation of the DVD’s integration into routine care suggests a significant improvement in

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pregnancy planning. Between June 2011 and June 2012, 64% of all women with diabetes in Northern Ireland who attended for antenatal care had received the DVD prior to pregnancy with 70% viewing it in preparation for pregnancy. Of those women who viewed the DVD, 36% subsequently contacted their diabetes care team for specialised pre-pregnancy care (PPC), 32% made lifestyle changes and 25% were already attending for PPC. Only 7% did not seek advice or make lifestyle changes. In 2007 the CEMACH report highlighted that two thirds of women received suboptimal care. Early interim results suggest that the DVD has had an impact on pregnancy planning indicators: 76% of women reported that they received PPC. Findings also suggest a 50% increase in the number of women taking folic acid 5mg pre-pregnancy. Final results will be available in 2014 and will establish the full impact of the DVD on pregnancy planning indicators and on maternal and neonatal outcomes in women delivering in Northern Ireland. Assuming the resource increases the number of women attending for PPC, it is likely there will be cost benefits for the health service. While no relevant UK statistics are available, an American study suggests net savings of \$34,000 dollars for each patient receiving PPC.

Conversion of the DVD to website delivery format in March 2012 ensures sustainability beyond the underpinning research project and seeks to maximise the beneficial impact of this work beyond Northern Ireland: 1003 website hits in the first year, including hits from 11 different countries: <http://go.qub.ac.uk/womenwithdiabetes>. The resource is available via the Primary Care Intranet to all GPs in Northern Ireland; resource links have been disseminated via the Diabetes in General practice group to 140 GPs with an interest in Diabetes in the Republic of Ireland.ⁱ Leading diabetes services sitesⁱⁱ host a link to the website; Diabetes UK; NHS Diabetes Innovations Hub and Insulin Dependent Diabetes Trust. Reach has been further extended through use as an educational resource in five cross-border PPC clinics operated on the island of Ireland.ⁱ Holmes and Alderdice have secured funding from the Public Health Agency, HSC R&D division, 2013 Knowledge Transfer Scheme to further maximise impact of the resource among women with diabetes and among healthcare professionals.

The resource is utilised as a learning tool for healthcare professionals, with an e-learning version integrated into the Midwifery education curriculum in Northern Ireland <http://www.qub.ac.uk/elearning/public/Diabetes/>, and has been the focus of several conference presentations: 'Innovations in Preconception care' workshop, National Diabetes in Pregnancy Conference, 2013; Keynote Lecture, National Association of Women Pharmacists Annual Conference 2013; Education award nominee (runner up), Diabetes UK Annual Professional Conference 2011, where researchers demonstrated the DVD's effectiveness in increasing women's knowledge and in enhancing their beliefs and attitudes to preventing an unplanned pregnancy and seeking PPC.

In other impacts, DAPIT has added to the evidence generated from 9 international trials to firmly establish that supplementation with vitamins C and E does not prevent pre-eclampsia,ⁱⁱⁱ with the impact of redirecting research and resources to other lines of investigation and treatment. Holmes and Alderdice have received funding from the International Diabetes Federation to develop and evaluate a resource for women with gestational diabetes, reflecting the team's standing as leading experts in the development of effective educational resources in this field.

Furthermore, and most importantly, the innovative PPC resource has received positive feedback from the target audience with many women expressing a wish that the resource had been previously available.^{iv}

'Why didn't I have this for my 1st pregnancy.... it would have helped me so much.' Woman A1

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5. Sources to corroborate the impact (indicative maximum of 10 references)**i. Organisations who can corroborate claims of contribution, benefit and impact:**

1. Consultant Physician, Antrim Hospital, Northern Health and Social Care Trust, Northern Ireland
2. Diabetes UK.
3. Chair of the Diabetes Services Implementation Group for Cork/Kerry, Republic of Ireland.
4. Consultant in Public Health Medicine, Public Health Agency, Northern Ireland re CAWT specialist diabetes pre-pregnancy care clinics, funded by European Union's INTERREG IVA programme, secured by Co-operation and Working Together (CAWT), the cross border health services partnership.

ii. Websites

5. Diabetes UK link to website:
http://www.diabetes.org.uk/Guide-to-diabetes/Living_with_diabetes/Pregnancy_and_diabetes/
6. NHS Diabetes Innovations Hub [link to website:](http://webarchive.nationalarchives.gov.uk/20130316063827/http://www.diabetes.nhs.uk/innovations_hub/information_technology/a_preconception_counselling_website_for_women_with_diabetes/#)
http://webarchive.nationalarchives.gov.uk/20130316063827/http://www.diabetes.nhs.uk/innovations_hub/information_technology/a_preconception_counselling_website_for_women_with_diabetes/#

iii. Reference

7. Conde-Agudelo A., Romero R., Kusanovic J.P., Hassan S.S. Supplementation with vitamins C and E during pregnancy for the prevention of preeclampsia and other adverse maternal and perinatal outcomes: A systematic review and meta-analysis *American Journal of Obstetrics and Gynecology*, 2011; 204 (6), pp. 503.e1-503.e12.

iv. Public Engagement:

8. Women with Diabetes, the end-user, were engaged in the research process: design, development and evaluation, providing feedback at each stage. Feedback from the service evaluation of the impact of the DVD within routine care yielded positive feedback from women with diabetes:
'Why didn't I have this for my 1st pregnancy.... it would have helped me so much.' Woman A1

v. Media Coverage / invited commentary:

- The DVD launch attracted media attention and an invited commentary:
9. Royal College of Midwives: Diabetes DVD urges women to plan for pregnancy. Researchers at Queen's University Belfast have produced a new DVD to encourage all women with diabetes to plan for pregnancy.
<https://www.rcm.org.uk/login/?ReturnUrl=%2fmidwives%2fnews%2fdiabetes-dvd-urges-women-to-plan-for-pregnancy%2f>
 10. Holmes VA. Developing an educational pre-conception DVD. *Diabetes and Primary Care* 2010; 12 (6): 332. (Invited Comment and Opinion Article).