Teachable moments and illness diagnosis

Qualitative studies

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design/Methodology	Findings	Study limitations
Luftman (2009) (PhD thesis)	To explore teachable moments within the context of a diagnosis of lunch cancer in terms of individual response -How does the diagnosis of lung cancer serve as a cueing event for the patient and their family members? -How do these responses present in different individuals within the sample?	USA	N=22 (4 patients, 18 relatives) **DEMOGRAPHICS** **Patient gender:** 2 male, 2 female **Family member gender:** 6 male, 12 female **Patient smokers:** 50% **Family member smokers:** 38% **Age:** M=63.4, range: 52-79	Qualitative, structured interviews, CAQDAS software, identification of codes **Relationship closeness inventory** **Smoking behaviour** -self-report, standardised items developed by the National Cancer Institute	**The affective codes:** Many emotions related to diagnosis were negative: anger, worry, sadness, shock, pain, hate, frustration. *People most likely to endorse increased emotionality:* -females were more likely to be emotional, especially those >35 years old	**Identified by the author:** purposive sampling; generalizability; brief interviews, homogenous sample **identified by the researcher:** time since diagnosis not reported

	-Were the processes that occurred when lung cancer was identified in the sample not described in current teachable moment models?		**Spouses of patients:** 3 (17%)		-non-smokers (especially women), patients and family members when patient alive showed more negative emotionality -females (especially over the age of 35) showed more positive emotionality -females, non-smokers were more likely to report feelings of blame **Cognitive codes** Understanding of the dangers of smoking was increased among relatives. *People most likely to endorse a change in cognition:*	

					-females over 35, non-smokers and family members were more likely to believe that smoking is bad for health -increased risk perception was more likely to be shown by those over the age of 35, females, non-smokers, family members and rural residents -female non-smokers, family members and rural residents were more likely to consider environmental factors -male under the age of 35, male non-smokers and rural residents were more likely to	

					report family influences **Behaviour codes** Indicated a desire to change or an actual change. A lot of participants reported talking to non-family members about their experience of the diagnosis *People found most often to make behavioural changes:* -females, especially non-smokers over the age of 35 and family members were more likely to speak up about smoking -females, people over the age of 35 and rural residents	

					were more likely to stop smoking -female non-smokers, males over 35 and rural males over 35 more likely to report physical barriers -females, males over 35, family members and rural females more likely to report emotional barriers **Key teachable moment message:** diagnosis of lung cancer is a teachable moment for both patients and their family members. Participants indicated as a direct result of the diagnosis, their affective state,	

					cognition and behaviours toward smoking had changed	
Thresia, Thankappan & Nichter (2009)	To investigate patients' sense of perceived risk of tobacco use as a factor associated with diabetes complications	India	N=444 **DEMOGRAPHICS** **Current smokers (N=100)** 82% cigarette smokers 77% bidi smokers **Age:** 55.8 **Education:** 90% literate **Socio-economic status:** 44% low and 56% from class	Qualitative, exploratory, interviews	Following diagnosis, 45% had quit completely. However, quitting was for general health reasons. Only 21% of the smokers and 25% of the chewers quit because they believed smoking can lead to diabetes complications. Following diagnosis, 27% of the cigarette smokers and 31% of the cigarette and bidi smokers reduced consumption by ≥75% and 30% of the bidi smokers reduced by 50%. 52% of people who did not quit,	**Identified by the author:** no participants from a upper socio-economic class **Identified by the researcher:** time since diagnosis not specified

					reported that smoking does not influence diabetes. Second-hand exposure was not perceived to impact diabetes. A small proportion reported the smoking may interfere with drug effectiveness. Patients did not tie specific symptoms with smoking. They believed that messages provided by health professionals were too general rather than specifically linked to diabetes, so they were dismissed. **Key teachable moment message:**	

					Messages provided by health professionals at the time of diagnosis, need to be specific and link current behaviour to condition-related health outcomes.	
Davey, Niñjo, Kissil & Ingram (2012)	To advance understanding of African American parents' experiences parenting their school-age children while navigating breast cancer	USA	N=9 patients **DEMOGRAPHICS** **Diagnosis:** breast cancer **Time since diagnosis:** 6 <1 year; 3<1-2 years **Age:** M=44, range: 34-56 **Ethnicity:** 100% African American **Religion:** Christianity **Income:**4 <$40 000 or less per year; 3 between $40 001	Exploratory, qualitative, focus groups, content analysis	Parents used the illness experience as a teachable moment for their children to teach them: -information about breast cancer -general health-related issues -how to cope with crises -the importance of gratitude, faith, positivity and courage	**Identified by the author:** small sample size; specific criteria for inclusion **Identified by the researcher:**

			and $80 000; 2 > $80 001 **Gender:** 8 women, 1 men **Marital status:** 2 single, 3 divorced, 4 married/partner			
Stead, Caswell, Craigie, Eadie, Anderson & the BeWEL team (2012)	To explore how participants with adenoma detected through colorectal cancer screening programme felt about their diagnosis and the extent to which the experience may motivate them to change behaviour. To explore whether adenoma diagnosis might represent a teachable moment	UK, Scotland	N=17 **DEMOGRAPHICS** **Gender:** 71% male **Age:** range 50-74 **Social deprivation (SIMD):** 18% in deciles 1-3; 47% deciles 4-7; 35% deciles 8-10.	Exploratory, qualitative, focus groups, thematic analysis	*Experience of adenoma diagnosis* Initial reaction to diagnosis was shock but there as a general perception that adenoma is a minor abnormality. *Understanding of causation* Lack of knowledge about the causes of adenoma *Attitudes towards receiving lifestyle change advice*	**Identified by the author:** small sample size; participants were self-selected

					People needed persuading of a potential causal link between their own behaviour and the condition before they would consider making lifestyle changes. People were either dismissive of advice or felt change was unrealistic. *Utilising the teachable moment* Once people grasped the possibility that lifestyle can contribute to adenoma, they welcomed the possibility of help to change behaviour. Some believed that information should be offered soon	

					after adenoma treatment. **Key teachable moment message:** If adenoma diagnosis and treatment are to be a teachable moment, patients need to be aware of the risk factors for adenoma and to relate these to personal behaviours.	
Breitkopf, Asiedu, Egginton, Sinicrope, Opyrchal, Howell,	To explore the perspectives of patients and family members regarding the experience of colorectal cancer	USA	N=21 patients; N=52 relatives. **DEMOGRAPHICS**	Mixed methods, exploratory; Interviews, questionnaires; Content analysis	*Emotional response to colorectal cancer diagnosis:* Although 67% of patients had a	**Identified by the author:** Only 14% were enrolled within 1 year of diagnosis;

Patten & Boardman (2014)	and receptivity to family-based cancer prevention programs.		**Diagnosis:** colorectal cancer **Time since diagnosis:** 14% <1 year, 67% 1-5 years, 19% >5 years. **Employed:** 54.8%; 17.8% missing data (more relatives were employed than patients) **Gender:** 42.5% male, 42% female (more female relatives and more male patients) **Marital status:** 65.8% married (more relatives than patients were married) **Education:** 13.7% high school; 8.2% vocational/technical; 23.3% college; 30.1% bachelor's degree; 6.8% professional		family history of colorectal cancer, their own diagnosis came as a shock. Emotional reaction was a process: shock-fear-denial-acceptance. *Personal risk perception and behavioural response:* Diagnosis of CRC heightened perceptions of vulnerability and risk among relatives. Many relatives were screened earlier than "normal people". Open communication within the family allowed people to have informed conversations with	no patient's father was interviewed; most of the participants were white and of European descent. **Identified by the researcher:**

			school; 17.8% missing data **Age:** M=51.5, range: 19-80 (patients were older than their relatives)		their doctors. Relatives felt that they could avoid CRC through exercise and diet, only a few initiated behaviour change together. Factors such as pain and childcare arrangements may prevent people from changing behaviour. Some expressed a perceived lack of control over CRC. *Family-based cancer prevention programs:* Participation was believed to depend on family dynamics. 91% of participants indicated they would be willing to	

					participate in a family program. Family programs were preferred over individual programs. Preferred methods of delivery were internet, telephone or written form. New programs could be aligned with existing programs (support groups to include an educational element) **Key teachable moment message:** For some the teachable moment occurred at the time of diagnosis ("if you wait too long, they are already gonna have formed opinions")	

					For others the teachable moment was after treatment ("we were all focused on her, and thinking we wouldn't want to take any time away")	
Coa, Smith, Klassen, Thorpe Jr., & Caulfield (2015)	To explore how prostate cancer survivors describe cancer as having affected their diet and what differentiates men who make post-diagnosis dietary changes from those who do not	USA	N=20 men with prostate cancer **DEMOGRAPHICS** **Diagnosis:** prostate cancer **Time since diagnosis:** M=4.5 years, range: 3-10 **Age:** M=64.2, range 50-74 **Race:** 7 Black, 13 White **Marital status:** 15 married/with	Mixed methods, exploratory; questionnaire, interviews, dietary recall diary; constant comparison approach	*Impact of cancer diagnosis on diet* Only 7 men (out of 20) indicated making changes to diet following their cancer diagnosis. Making changes depended on perceptions of the healthfulness of their pre-diagnosis diet and beliefs about the relationship between cancer and diet.	**Identified by the author:** No data on men's cancer stage and grade; no data on masculinity beliefs and perceived gender norms **Identified by the researcher:**

			partner; 6 separated/widowed **Occupation:** 11 employed, 7 retired, 2 disabled **Education:** 2 high school; 1 post-high school training; 5 college; 12 postgraduate **Income:** 3 $10 000-34 999; 1 $35 000-49 999; 4 $50 000-$74 999; 10 - >$100 000; 2 didn't answer **BMI:** 4 normal, 11 overweight, 5 obese		Some made changes to address cancer-related concerns while others described how cancer interacts with existing health issues to motivate dietary changes. The men who did not make changes perceived cancer as likely to recur or did not think diet would have an effect on recurrence. Many men believed cancer occurred in the past so it does not require dietary changes. *Influences on diet* Perceived willpower; lack of time; dietary habits of wives/partners;	

					cost/accessibility of healthy foods. **Key teachable moment message:** cancer plays little, if any, role in dietary decision making. However, prostate cancer survivors might represent a motivated group that could benefit from targeted intervention.	

Quantitative studies

Author and year	**Study aim(s) as relevant to the current review**	**Country**	**Participants (number and characteristics)**	**Design**	**Measure(s)**	**Results**	**Study limitations**
Gritz,Carr,Rapkin, Abemayor, Chang, Wong, Belin, Calcaterra, Robbins, Chonkich, Beumer& Ward (1993)	To test the effectiveness of a smoking cessation intervention in newly diagnosed head and neck cancer patients	USA	N=114 **DEMOGRAPHICS** **Age:** 57.8 **Education:** 11.7 years **Gender:** 69.3% male, 30.7% female **Marital status:** 56.1% married; 43.9% non-married	Randomised control trial Usual care (advice) vs. extended advice	**Perceived nicotine dependence and attitudes towards smoking:** -Fagerström tolerance questionnaire **Readiness to stop using tobacco**	High abstinence rates for all participants. No significant intervention effect. People smoking at 12-month follow-up	**Not all participants were smokers at baseline; the same health practitioners delivered intervention**

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			Ethnicity: 76.3% White; 16.7% Black; 7% other **Cigarettes smoked per day:** 24 **Stage of change:** 21% pre-contemplation; 38.6% contemplation; 40.4% action/maintenance		-pre-contemplation, contemplation, action, maintenance **Smoking abstinence** -cotinine in urine	*(n* = 30) had significantly reduced their consumption during the study, from 25.4 cigarettes/day (SD = 12.8) at baseline to 12.5 (SD = 8.1) at 12 months (t = 7.67; *P* =0.0001) Readiness to change was associated with abstinence rates. **Key teachable moment message:** a standard care approach may be sufficient if delivered at the right time.	**and control sessions.**
McBride, Clipp, Peterson, Lipkus& Demark-Wahnefried (2000)	To explore: -is psychological impact associated with the likelihood of risk reducing behaviour?	USA	Prostate cancer patients N=420 **DEMOGRAPHICS** **Age:** M=68, range: 43-90 **% White:** 90% **Time since diagnosis:** median: 3.3 years, range: 0.8-6.2 years Breast cancer patients	Exploratory, cross-sectional	**Impact of events scale (IES)** **Self-rated health** **-**excellent, good, fair, poor **Exercise** -how many times per week	Psychological impact of diagnosis decreased with age (prostate cancer p=.0004; breast cancer p<.0001). Those who rated their health status as	**Identified by the author:** Generalizability: African-Americans were under-represented; healthier patients were

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	-does this differ across groups of patients? -how does time from diagnosis influence these associations?		N=500 **DEMOGRAPHICS** **Age:** M=57, range: 28-91 **% White:** 92% **Time since diagnosis:** median 2.9 years, range: 0.4-6.2 years		-duration of average session -length of time exercise has been part of their routine **Stage of readiness to begin exercising** -are you seriously thinking about starting an exercise program within the next 6 months? -are you planning to start an exercise program within the next 30 days? **Fruit and vegetable consumption** -food frequency questions used in the "five a day" trials **Stage of readiness to eat five a day** -hoe long have you been consuming five or more daily	fair to poor had significantly greater median impact scores than those who reported being in good to excellent health (prostate cancer p=.02; breast cancer p=.004). The impact of diagnosis was significantly lower with each yearly increment following diagnosis for prostate cancer (p=.05) but not for breast cancer. Patients who reported risk reducing behaviours also reported significantly lower impact of the diagnosis than those who did not engage in these behaviours	over-represented; self-report measures. **Identified by the researcher:**

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					servings of fruit, vegetables or juices? -are you seriously thinking about eating five or more daily servings of fruits and vegetables (including juices) within the next 6 months? -are you planning to eat five or more daily servings of fruits and vegetables (including juices) within the next 30 days? **Smoking** -if they have smoked more than 100 cigarettes during their lifetime -if they currently smoked	(e.g. prostate cancer & regular exercise: p=.02; breast cancer & fruit and vegetable consumption: p=03) **Key teachable moment message:** Cancer diagnosis alone may not prompt behaviour change. However, directions of these associations cannot be determined: those who were most impacted may have changed behaviour after diagnosis but before the study and reported lower impact; people who experienced greater impact may have felt unable to make changes.	

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					Readiness to quit smoking -are you seriously thinking about quitting within the next 6 months? Are you planning to quit within the next 30 days? **Interest in health-related programs** -yes vs. no		
Lemon, Zapka&Clemow (2004)	To describe patterns of lifestyle behaviour changes after the relative's diagnosis	USA	N=600 first-degree female relatives of newly diagnosed breast cancer patients (within 8 weeks of diagnosis) **DEMOGRAPHICS** **Age:** 32.5%< 40; 30.5% 40-49; 37%>50 **Marital status:** 68.8% married/living together; 17.2% divorced/separated/widowed; 14% never married **Education:** 33%≤high school; 28.8% post high school; 38.2% college degree	Longitudinal, cross-sectional	**Health behaviour change since relative's diagnosis:** -physical activity -fruit and vegetable consumption -fat consumption -alcohol consumption -smoking **Perceived disease severity** -how likely it is that breast cancer will	**Breast cancer perceptions:** -77% perceived themselves to be at a higher risk of breast cancer compared to women without family history of breast cancer. -75% believed regular exercise decreased risk --67% believed a high fat diet increased risk -70% believed a	**Identified by the author:** Self-report measures; lack of information on dose of behaviour change and its effect on health; homogenous sample;

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			Employment: 27.8% unemployed; 23.8% <36 h/w; 48.3%≥36 h/w. **Relationship to index patient:** 43.1% daughter; 50.9% sister; 6% mother		shorten their relative's life **Personal risk perception** -perceived chances of women without family history of breast cancer to develop the condition -compare their chances of getting breast cancer to those of other women with family history of the disease **Perceived control** -how possible it is for women to reduce chances of developing breast cancer -how possible it is for them personally to reduce chances of developing breast cancer	diet high in fiber or fruits and vegetables decreased risk -60%of drinkers believed drinking a lot of alcohol increased risk -87% of smokers believed it increased risk 42% reported any health behaviour change in the 6 months following index patient diagnosis, with 19% reported change in one behaviour, 13% in two and 10% in three or more. Increased age was associated with decreased likelihood of improving physical activity	

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					Perceptions of primary prevention -how likely different health behaviours are to reduce chances of developing breast cancer	(p=.04) and increased likelihood of smoking cessation (p=.001). Higher education was associated with fruit and vegetable consumption (p=.02). Full-time employment was associated with decreased alcohol consumption (p=.02). Excellent perceived health was associated with increase in healthy behaviours (all p≤.05). Underweight/normal weight women were less likely to improve diet. **Key teachable moment message:** breast cancer diagnosis in a first-	

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						degree relative is a teachable moment.	
Geller, Emmons, Brooks, Powers, Zhang, Koh, Heeren, Sober, Li & Gilchrest (2006)	To test whether an intervention could lead to improvements in skin melanoma patients' siblings' skin cancer risk reduction practices	USA	N=494 siblings of melanoma patients **DEMOGRAPHICS** **Time since diagnosis in relative:** up to 1 month **Intervention** N=327 **Gender:** 48.1% male, 51.9% female **Age:** 55.7% -18-50; 44.3% -51+ **Education:** 24.4% high school or less; 44.3% college. **Skin type:** 81.3% fair, 18.7% dark **Usual care** N=257 **Gender:** 45.1% male, 54.9% female **Age:** 60.6% -18-50; 39.4% -51+ **Skin type:** 88% fair, 12% dark	Randomised controlled trial -two arms: intervention and control (usual care) -telephone counselling sessions and print materials at 1, 3 and 5 months after randomization	**Self-efficacy** -Likert (1-5) **Barriers** **-on early detection** **-for sun protection** **-for skin examination** (five responses from strongly disagree to strongly agree contributing different points to the scale)	Increase in skin self-examination practices in the intervention group. Increase in the thoroughness of the skin self-examination in the intervention group. No difference on dermatologic skin examination. No difference in sun protection use. **Key teachable moment message:** mixed findings	**Identified by the author:** Self-report measures; not population-based sample; no cost-benefit analysis; recruitment across seasons; high attrition; staff contacts with participants **Identified by the researcher:**
Humpel, Magee & Jones (2007)	To examine the effect of a	Australia	**DEMOGRAPHICS** **Patients**	Exploratory, cross-sectional	**Demographics**	**Cancer survivors:**	**Identified by the author:**

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	cancer diagnosis on the health behaviours of cancer survivors and their family and friends and to determine whether a cancer diagnosis could be a teachable moment for intervention		N=113 **Diagnosis:** 41.6% breast cancer; 14.9% melanoma; 10.9% cervical; 6.9% colon/rectal; 5.9% ovarian; 19.8% other. **Time since diagnosis:** 2.7% within 3 months; 9% 3months to 1 year; 17.1% 1 to 2 years; 71.2% more than 2 years. **Gender:** 13.2% men, 86.7% women **Age:** 5.3%<35; 45.1% 36-55; 49.6% >55 **Education:** 40.7%<10 years; 32.7% 12 years; 22.1% tertiary **Work status:** 0.9% student; 27.4% full-time; 24.8% part-time; 44.2% home/retired/volunteer; 1.8% unemployed. **Relatives** N=544 **Gender:** 19.7% men, 80.3% women **Age:** 29.1% <35; 44.9% 36-55; 25.9% >55		**Physical activity levels** (the Active Australia Survey) **Dietary changes** **Number of family and friends diagnosed with cancer** **Perceived risk of getting cancer**	31.3% of patients reported increase in physical activity, 62.5% remained the same, 6.3% decreased physical activity. 50% of smokers quit and 76.7% reported more sun-safe behaviours. The majority of cancer survivors made positive dietary changes after diagnosis. Most of the patients who made health behaviour changes did so within 6 months of diagnosis. No relationship between demographic factors and health behaviour was seen in cancer survivors, apart from age (older people were	Respondents were recruited from a walking event so they may already be motivated to change behaviour; number of people with cancer was much smaller than number of people without; the majority of patients were women with breast cancer. **Identified by the researcher:** Time since diagnosis in the majority of people is over 2 years; measures are not well documented

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			Education: 34.2% <10 years; 33.8% 12 years; 30.9% > tertiary **Work status:** 7.4% student; 49.4% full-time; 20.8% part-time; 21.9% home/retired/volunteer; 0.6% unemployed.			more likely to make dietary changes) and employment (employed people more likely to increase fibre intake). **Relatives:** People with more than three family members with cancer engaged in less vigorous physical activity than people with no family members diagnosed (p<.05). People with more than three friends with cancer engaged in more moderate physical activity compare to people with no friends diagnosed (p<.01) and one friend diagnosed (p<.01)	

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						24.3% reported increase in physical activity,36.2% reported quitting smoking; 59% reported more sun-safe behaviour. The majority reported positive dietary changes. No difference according to demographic factors except for age (older people more likely to make positive changes). Greater perceived risk of cancer was associated with increase in sun-safe behaviour and physical activity. Knowing more than three family members or relatives with cancer leads to nearly significant increase	

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						in fibre and decrease in takeaway food. **Comparison:** Changes in physical activity and smoking did not differ significantly between individuals with and without cancer diagnosis. Cancer survivors made more positive changes in sun-safe behaviour and diet in comparison to people without cancer (p=.000). **Key teachable moment message:** Whether cancer diagnosis can be a teachable moment in family/friends depends on: -the extent to which cancer diagnosis prompts a strong emotional response	

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						-individual's perception of their risk for cancer -they believe a behaviour change will help reduce this risk.	
Sharp, Johansson, Fagerström&Rutqvist (2008)	To evaluate the effectiveness of a nurse-led smoking cessation programme for patients with head and neck cancer	Sweden	N=50 **DEMOGRAPHICS** **Gender:** 82% male, 18% female **Age:** M=62, range 42-88 **Stage:** 38% I and II; 62% III and IV **Comorbidity:** 12% pulmonary disease; 14% other cancer diagnosis; 40% cardiovascular disease; 22% psychiatric morbidity; 6% diabetes **Living alone:** 40% yes, 58% no, 2% homeless **Smoking debut age:** M=16, range: 7-45 **Earlier attempts to quit smoking:** 46% yes, 54% no **Living with a smoker:** 26% yes, 74% no **Other substance abuse:** 60% yes	Non-randomized consecutive patient study	**Expiratory carbon monoxide (CO)** **Nicotine dependence** **-**Fagerström test for nicotine dependence **Self-reported smoking and abstinence**	74% of patients were tested smoke-free during the radiotherapy period. At the 1-year follow-up, 68% were tested smoke-free. **Key teachable moment message:** Cancer diagnosis may be a teachable moment M even for patients with long history of nicotine dependence and multi-drug abuse. However, relatively intense interventions may be appropriate for this group of patients.	**Identified by the author: - Identified by the researcher:**time since diagnosis not reported

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Alfano, Day, Katz, Herndon II, Bittoni, Oliveri, Donohue &Paskett (2009)	To investigate the prevalence and clustering of changes in diet and exercise after a cancer diagnosis and how these changes related to cancer symptoms, social support and stressful life events	USA	N=227 breast cancer survivors **DEMOGRAPHICS:** **Diagnosis:** breast cancer **Age:** M=61.9, range: 34-84 **Race:** 93% White, 7% Other **Education:** 53%-0-12 years; 36%-13-16 years; 11%-17-20 years. **Income:** 17% <$20 000; 29% - $20 000-$44 999; 22% - $45 000-$79 999; 18% - >$80 000. **Relationship status:** 6% single, 68% married/living together; 26% separated/widowed **Years since diagnosis:** M=12.4; range: 9.4-16.5	Quantitative, cross-sectional, descriptive	**Health behaviours:**"Since your breast cancer diagnosis, have you done any of the following?" -changes in exercise habits and dietary intake (fat, fibre, fruits and vegetables) **Symptoms:** Medical Outcomes Study Short Form-36 vitality subscale **Depression:** Centre for Epidemiologic Studies-Depression Scale **Fear of recurrence:** Breast Cancer Anxiety and Screening Behaviour scale **Satisfaction with sexual functioning:**	58% of the participants made positive changes in diet and/or exercise (26.5% in exercise and at least one diet behaviour) People who increased exercise since diagnosis reported less fatigue compared to women who did not increase exercise (p=0.03). People who increased their fruit and vegetable intake since diagnosis reported less fatigue compared to women who did not increase fruit and vegetable intake (p=0.06). Women who increased exercise reported greater social support in	**Identified by the author:** Small predominately White sample, self-reported behaviour, non-validated scales, lack of information on weight, pre-cancer levels of health behaviours, whether they changed behaviour by a clinically meaningful amount. **Identified by the researcher:** Measures not taken at time of diagnosis.

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					the Sexual Satisfaction Scale of the Watts Sexual Functioning Questionnaire **Body satisfaction:** Self-concept scale **Social support:** MOS Social Support Survey **Stressful life events:** Life Events Scale **Demographics**	comparison to women who did not increase exercise (p=0.06). No differences in social support inrelation to changes in diet. No differences in relation to stressful life events. **Key teachable moment message:** Health promotion efforts should capitalise on cancer diagnosis as a teachable moment. However, survivors need assistance in changing behaviour.	
Butler, Rayens, Zhang & Hahn (2010)	To assess the level of motivation to quit, tobacco use indicators, and perception of lung cancer risk	USA	N=29 **DEMOGRAPHICS** **Age:** average: 44.9, range: 23-74 **Race:** 89% White **Education:** 48% high school or less; 52% postsecondary education	Cross-sectional, nonexperimental	**Tobacco use and quit attempt indicators** -forms of tobacco, cigarettes per day, method used for quitting **Motivation to quit**	The degree of motivation to quit smoking was not related to age, gender, ethnicity, education, marital	**Identified by the author:** Small sample size, selection bias, lack of information on years smoked

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	To evaluate the perceived appropriateness of talking with relatives of lung cancer patients about smoking cessation during the patient's treatment To determine which demographic, personal, and tobacco use indicators are associated with the motivation to quit using tobacco.		**Marital status:** 66% married **Employment:** 48% employed **Income:** 48% ≥$25 000		**-**asked how lung cancer in the family affected their motivation **Stage of readiness** -ever intends to quitsmoking or using tobacco (precontemplation) -seriously considering quitting within the next 6 (contemplation) -has firm plans to quit in the next 30 days (preparation) -has succeeded in not smoking or using tobacco for up to 6 months (action) -has not smoked or used tobacco for more than 6 months (maintenance)	status, employment status, income, or cigarettes smoked per day. Motivation to quit smoking was positively correlated with stage of change, perceived risk of lung cancer, and the two measures of acceptability of talking about cessation. Nearly three fourths of smoking family members of lung cancer patients reported that their motivation to quit smoking had increased with their family lung cancer	or levels of addiction **Identified by the researcher:** Time since diagnosis not reported; no control group

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					Perceived lung cancer risk **Acceptability of talking about smoking cessation with relatives** -How appropriate is it to talk with relatives of lung cancer patients about quitting smoking when their loved one is going through treatment? -To what degree were you glad that someone talked with you today about quitting smoking?	experience, and they planned to quit in the next 6 months. **Key teachable moment message:** Most participants were glad they had been asked about their interest in quitting smoking, and most felt that having this discussion about cessation while their loved one was undergoing treatment for lung cancer was appropriate. Smokers with all demographic characteristics are prepared to quit smoking at the time of lung cancer diagnosis in a family member.	

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Hayes, Dunsiger&Borrelli (2010)	To examine the role of depressed mood on the relationship between physical quality of life and smoking cessation among medically ill patients.	USA	N=237 patients **DEMOGRAPHICS** **Diagnosis:** 34.3% lung disease; 40.7% cardiovascular disease; 29.2% diabetes; 35.2% hypertension; 2.1% lung cancer; 10.2% other cancers **Gender:**53.6% female **Age:**M=56, range: 21-89 **Marital status:**28% married/living together; 51.7% divorced/widowed; 19.1% never married **Education:**39% less than 12 years; the rest had at least a high school degree **Employment:**90.7% not employed **Income:** 58.6% < $9 999; 21.1% between $10 and $19 999. The remaining over $20 000. **Ethnicity:**81.4% Caucasian; 13.9% African American; 2.5% Hispanic; 1.3% American Indian; 8% Cape Verdian. **Smoking status:** M=21.4 cigarettes per day; moderate	Exploratory; hypothesis testing; data from a previous randomised controlled trial: -Standard care -Motivational enhancement	**Demographic** **Smoking history** **Nicotine dependence** (Fagerstrom test for nicotine dependence) **Motivation to quit smoking** (contemplation ladder **Depressed mood** (centre for epidemiological studies depression scale) **Quality of life** (medical outcomes study short-form general health survey)	Motivation to quit and nicotine dependence were not associated with smoking outcomes. As physical quality of life decreases, smokers with depressed mood are less likely to quit smoking. Those with poor physical quality of life but with little depressed mood are more likely to quit smoking. **Key teachable moment message:** The teachable moment of living with an illness is more effective when health risks of smoking are salient and potentially not clouded by negative affect and depressed mood.	**Identified by the author:** Quality of life was not measured objectively; limited generalizability. **Identified by the researcher:** Time since diagnosis not specified

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
			nicotine dependence (Farerstom M=3.2)			A serious illness is more likely to heighten a person's perceptions of vulnerability regarding their health and thus may lead to behaviour change.	
Patterson, Wileyto, Segal, Kurz, Glanz& Hanlon (2010)	To examine whether having a lifetime history of cancer or having a family member with a lifetime history of cancer is predictive of intention to quit smoking.	USA	N=1145 current smokers **DEMOGRAPHICS** **Gender:** 42% male; 58% female **Race:** 80% Caucasian; 20% Non-Caucasian **Age:** 48%<42 years; 52%≥42 years **Education:** 47% some college; 53% no college **Smoking rate:** 77% daily smoker; 23% not daily smoker **Personal history of cancer:** 12% yes; 88% no **Family member with a history of cancer:** 66% yes; 34% no	cross-sectional, exploratory	**Cancer diagnosis** -have you ever been told by your doctor that you had cancer? (yes/no) -have any of your brothers, sisters, children or close family members ever had cancer? (yes/no) **Negative affect** **-**during the past 30 days: 1. how often did you feel so sad that nothing could cheer you up?	Having a personal lifetime history of cancer was not associated with intention to quit. Having a family member with a lifetime history of cancer was associated with intention to quit (p<.01). Participants with a personal lifetime history of cancer reported elevated levels of negative affect (p=.02) and lower levels of	**Identified by the author:** Recall bias; secondary analysis; only 140 had a lifetime history of cancer; time since diagnosis not known; lack of information about the family member with a lifetime history of cancer and the closeness of the relationship (e.g. spouse, cousin).

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					2.how often did you feel nervous? 3.how often did you feel restless or fidgety? 4.how often did you feel hopeless? 5. how often did you feel that everything was an effort? 6.how often did you feel worthless? 7.how often did these feelings interfere with your life? -1 all the time-5 none of the time **Cancer risk perception** --how much higher is your chance of getting cancer? -How likely are you to get lung cancer? -how likely do you think it is that you	cancer avoidance ($p<.01$). Participants with a family members with a lifetime history of cancer reported higher levels of negative affect ($p<.01$) and lower levels of cancer avoidance ($p<.05$). No relationship between personal or family member history of cancer and attention to seeking health information. Individual risk perceptions had a significant positive coefficient indicating that smokers who had a family member with a lifetime history of cancer were more	**Identified by the author:** use of measures specific to this study

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					will develop cancer in the future? -Is there anything about your behaviour or lifestyle that you would like to change to reduce your chances of getting cancer? -can you think of anything that people can do to reduce their chances of getting cancer? -1 low risk-5 high risk OR yes/no **Attention to health information** -how much attention did you pay to health information 1. in magazines 2. in newspapers 3. on television 4. on the radio	likely to report intending to quit if they also reported elevated levels of perceived risk for cancer (p=.001). **Key teachable moment message:** Family members of people who have ever had a diagnosis of cancer are a viable intervention target for smoking cessation.	

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					- 1 a lot – 4 not at all **Cancer preventability** -people can't do much to lower their chances of getting cancer -there are too many recommendations -everything causes cancer -5-point scale **Cancer avoidance** -there's no risk of getting cancer if someone only smokes a few years -exercise can undo the effects of smoking **Intention to quit smoking** -whether they planned to quit -yes/no **Current smoking behaviour**		

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					-daily/not daily **Demographics**		
Nicholson, Tyc& Lensing (2012)	To explore the impact of parents' psychosocial variables (perceived stress and vulnerability, self-efficacy), as well as health – related and demographic variables, on children's current exposure levels.	USA	N=135 **DEMOGRAPHICS** **Children** **Age:** M=8.6, range: 0.4-17.7 **Gender:** 47.4% female, 52.6% male **Diagnosis:** 7.4% CNS, 65.2% leukemia/lymphoma, 27.4% solid tumor. **Time since diagnosis (months):** M=7, range: 1-59.5 **Parents** **Age:** M=34.7, range: 19.6-61.2 **Gender:** 83% female, 17% male **Marital status:** 57.8% married; 9.6% divorced/separated; 32.6% never married. **SES:** 49.6% low; 24.4% middle; 25.9% high. **Target parent status:** 70.3% smoker; 29.6% non-smoker **Smokers in home:** 51.9% 0-1; 48.1% 2 or more	Cross-sectional, exploratory	**Demographic and diagnostic variables** **Psychosocial** -ability to maintain a smoke-free environment, 4-point Likert scale (not at all confident-very confident) **Perceived vulnerability of their child to general health and tobacco-related problems** -14-item measure, 5-point Likert scale (strongly agree-strongly disagree) -I am worried about my child's exposure to second-hand smoke because	Self-efficacy was significantly associated with child urine cotinine levels ($p<.001$). Urine cotinine was 2.8 times higher for children whose target parent was a smoker compared to those whose target parent was a non-smoker. Differences in cotinine levels according to marital status and SES with a 47% reduction for married parents as compared to singles and a 51% reduction for high SES families compared to low SES ones. Time since diagnosis was a significant	**Identified by the author:**lack of a comparison group; measures were constructed for this study. **Identified by the researcher:**

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					he/she is being treated for cancer -Later health problems can be prevented if my child is not exposed to second-hand smoke **Perceived stress scale** **-**14-item, 5-point Likert scale (never-very often) -degree to which situations are perceived as unpredictable, uncontrollable, overwhelming **Parent-reported child SHSe** -number of cigarettes to which the child is exposed for the previous seven days	predictor: children who were less than 6 months from diagnosis had a 44% reduction in urine cotinine compared those who were six months or more from diagnosis. **Key teachable moment message:** There may be a teachable moment during the early stages of treatment when families may be more sensitive to the health consequences of their smoking for their children and more likely to make health behaviour changes. Parents with high self-efficacy and those whose children were more recently diagnosed	

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
					Urine cotinine assays from children	may be primed for a teachable moment.	
Bidstrup, Dalton, Christensen, Tjonneland, Larsen, Karlsen, Brewster, Bondy& Johansen (2013)	To compare changes in BMI, alcohol and tobacco consumption following a breast cancer diagnosis	Denmark	N= 23 420 women (22 971 cancer-free; 449 diagnosed with breast cancer) **DEMOGRAPHICS** **Diagnosis:** breast cancer **Age:** M=56.7; range: 50.3-65.4 **Education:** 16% basic/high school; 29% vocational training; 55% higher education; 1% unknown. **Marital status:** 6% never married; 29% divorced/widowed; 64% married/with partner; 1% unknown	Quantitative, prospective, exploratory	**Smoking habits** -asked participants how much they smoke per day (summed as grams) **Alcohol consumption** -asked participants how often they drunk different types of alcohol (summed as grams and frequencies calculated) **BMI**	The mean tobacco consumption decreased in both groups (both p<.0001). The mean alcohol consumption increased in both groups (both p<.0001). No significant between-group changes. Among women who lost weight, those with breast cancer lost more weight. Time between diagnosis and date at follow-up was not associated with changes. Changes in BMI, tobacco and alcohol consumption among women with cancer	**Identified by the author:** At baseline height and weight were measured by health professionals; they were self-reported at follow-up; time since diagnosis was up to 6 years (M=2.6) **Identified by the researcher:** Used non-validated scales

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
						were not associated with demographic factors. **Key teachable moment message:** Breast cancer diagnosis may be a motivation strong enough to prevail obstacles women experience when diagnosed. Cancer diagnosis creates a potential for behaviour change, but this needs to be encouraged.	
Hayran, Kilickap, Elkiran, Akbulut, Abali, Yuce, Kilic&Turhal (2013)	To determine the rate and habitual patterns of smoking, intentions of cessation, dependence levels and socio-demographic	Turkey	N=560 relatives of cancer patients **DEMOGRAPHICS** **Age:** M=47.6 **Gender:** 57% male, 43% female **Marital status:** 70% married; 22% single; 2% widowed; 6% not specified **Relationship with patient:** 2.1% mother/father; 10.7%	Exploratory, cross-sectional	**Smoking habits, intention of cessation, perceptions about smoking bans, level of addiction** (Fagerstrom test of nicotine dependence)	2% started smoking after cancer was diagnosed in their relative, 20% quit smoking after cancer was diagnosed in their relative. Lung cancer and breast cancer had	**Identified by the author:** **Identified by the researcher:** Lack of important details: what scales were used; time since diagnosis

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
	characteristics of relatives of patients with a cancer diagnosis in an effort to explore the potential of diagnosis as a teachable moment for smoking cessation		sibling; 43% child; 24.5% spouse; 15.4% other; 4.3% not specified. **Living in the same house:** 57.2% yes, 42.1% no **How often together with the patient:** 67.7% every day; 15.4% few times a week; 4.5% once a week; 12.4% less **Education:** 6.3% literate; 38.6% primary; 25.4% high; 29.5% university **Household income:** 40.2% <1000TL; 37.3% 1001-3000TL; 13.8% >3000TL **Smoking status:** 43.2% yes, 56.3% no **Cancer site:** 20.4% breast, 14.3% lung, 13.4% colorectal, 11.6% non-colorectal GIS, 7.5% haematological, 2.5% gynaecological, 2.1% head and neck, 7.1% other, 21.1% not specified.			the greatest effect on cessation rates. Significant difference between quit rates reported in previous studies (5%) and the quit rates in this study (20%) (p<.001) People with higher Fagerstrom scores were less willing and planning to quit smoking. **Key teachable moment message:** Cancer diagnosis is a major teachable moment patients' relatives.	not specified; procedures are not well documented.
Schnoll, Wileyto, Leone, Langer, Lackman& Evans (2013)	To assess whether a cancer diagnosis could	USA	N=121 orthopaedic patients' relatives N=113 oncology patients' relatives	Prospective, observational	**Demographics** **Nicotine dependence:**	Orthopaedic patients' relatives were older, more likely to be female	**Identified by the author:** Differences between the

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
	lead to increased enrolment unto a smoking cessation program and increased smoking cessation rates among patients' relatives.		**DEMOGRAPHICS** **Orthopaedic patients' relatives** **Gender:** 62% female **Age:** M=49.2 **Marital status:** 40% married **Education:** 10.5% college or above **Race:** 22.3% European Ancestry **Fagerström score:** M=4.6 **Cigarettes per day:** M=15.3 **Age started smoking:** 16.5 **Oncology patients' relatives** **Gender:** 50.4% female **Age:** M=44.7 **Marital status:** 40.4% married **Education:** 18.6% college or above **Race:** 58.4% European Ancestry **Fagerström score:** M=4.4 **Cigarettes per day:** M=17.6 **Age started smoking:** 16.4 **Time since diagnosis:** within the past 6 months		-Fagerström test for nicotine dependence **Depression symptoms** **-**Centre for epidemiologic studies depression scale **Anxiety** **-**state-trait anxiety inventory **Mood** -The positive and negative affect scale (PANAS) **Risk perceptions** **-**health risk subscale from the smoking consequences questionnaire **Outcome expectancies** **-**the decisional balance scale **Enrolment** **Cessation rates** -self-reported	and less likely to be of European ancestry (p's<.05). 75% of the relatives of cancer patients attended the visit, compared to 60% of relatives of orthopaedic patients. Cancer patient relatives were more likely to attend the first session of the cessation program but this difference was not significant. Relative group was not associated with abstinence rates. Compared to orthopaedic relatives, cancer relatives showed higher depression symptoms (p<.05), anxiety symptoms	two groups; use of transdermal nicotine may have limited enrolment and cessation rates given its reduced efficacy relative to newer medications.

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					Adherence -self-reported daily patch use	(p<.05) and negative affect (p<.05) and higher pros of smoking (p=.06). Orthopaedic patients showed significantly greater patch use during 6 of the 8 weeks of treatment. Orthopaedic patients showed greater rates of counselling attendance for the three of the final sessions. Relatives of cancer patients were significantly more likely to attend initial program visit. Targeted recruitment of these patients could increase enrolment	

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
						rates. **Key teachable moment message:** While teachable moments for smoking cessation may spark initial motivation to quit smoking, it may not be sufficient to ensure downstream behaviour change. Additional strategies to sustain the impact of a teachable moment may be necessary.	
Demark-Wahnefried, Jones, Snyder, Sloane, Kimmick, Hughes, Badr, Miller, Burke &Lipkus (2014)	To capitalize on the mother-daughter bond and the teachable moment created by a cancer diagnosis to promote weight loss in overweight or	USA	N=68 dyads (mothers and daughters) **DEMOGRAPHICS** **Diagnosis:** breast cancer **Time since diagnosis:** M=24 months **Distance between mother & daughter:** M=75 miles, range: 0-646 **Race:** 74% non-Hispanic white; 7% Hispanic white;	Randomized feasibility trial: -Individual arm, team arm, control -written materials bimonthly for 1 year	**BMI** **Waist circumference** **Blood pressure** **Exercise capacity:** a symptom-limited cardiopulmonary exercise test (CPET) **Dietary recall:** Nutrition Data	BMI: significant reduction in mothers (p=.03) in the individual arm; Weight loss: clinically significant weight loss in mothers in the individual arm (p=.04); no difference across conditions	**Identified by the author:** **Identified by the researcher:** Small sample size to observe significance; Mean distance between mothers and

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
	obese women recently diagnosed with breast cancer and their overweight or obese daughters		18% African American; 1% Asian. **Age mothers:** M=61.3, range:46-80 **Age daughters:** M=32.9, range:21-54 **Education status mothers:** 1.5% less than high school; 26.9% high school; 37.3% college; 34.3% postgraduate **Education status daughters:** 0% less than high school; 10.3% high school; 35.3% college; 54.4% postgraduate. **Income (<$40K/y):** mother: 34.3%**;** daughters: 28% **BMI:** mothers: M=31; daughters: M=32.9		System-Revised software **Physical activity:** Leisure-Time Exercise Questionnaire of Godin et al (1986) **Self-efficacy:** -1-5 Likert scale -how confident or sure are you that you could walk or do another type of exercise for at least 30 minutes on 5 or more days of the week? -how confident or sure are you that you could regularly limit the number of calories you eat or drink? **Weight:** self-reported	Waist circumference: significant reduction in mothers and daughters in the individual arm (p=.004 and p .03, respectively). Physical activity: increase for dyads in minutes of moderate to vigorous activity in both the team and individual arms (p=.009) No between differences in energy intake or diet quality. Lack of improvement in social support and satisfaction with the mother-daughter relationship in the team arm No change in self-efficacy **Key teachable moment message:**	daughters is 75 miles; Time since diagnosis is 2 years; the materials in the individual and team arm were almost identical

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Sabiston, Brunet, Vallance&Meterissian (2014)	To prospectively examine patterns of sedentary and moderate-to-vigorous physical activity at 3-month intervals during a 1-year period following completion of primary treatment	Canada	N=177 breast cancer survivors **DEMOGRAPHICS** **Age:** M=54.93 years **BMI:** M=26.31 (normal weight: 48.6%; overweight: 31.1%; obese: 20.3%) **Waist circumference:** M=90.3 cm (53.8%>88cm) **Education:** 5.6% < high school; 23.2% high school; 18.6% college; 28.2% university; 24.3% postgraduate **Marital status:** 15.3% single; 62.7% married/common-law; 16.4% separated/divorced; 5.6% widowed **Stage of breast cancer:** 42.4% I; 39.5% II; 18.1% III **Months since diagnosis:** M=10.59 **Months since treatment:** M=3.49	Prospective, observational	**Physical activity** **-**accelerometers for a 7-day period **Weight status** **-**BMI and waist circumference (height, weight and waist circumference measured by a research assistant) **Demographics**	Survivors were highly sedentary and inactive across all the time points. Nearly 29% met moderate-to-vigorous physical activity guidelines at baseline, compared to 22% at 12 months. Healthy weight women decreased sedentary time early in the post treatment period, whereas women with unhealthy weight increased sedentary behaviour. **Key teachable moment message:** Although people may be more	**Identified by the author:** convenience sample, limited generalizability, accelerometers do not capture accurate workload (e.g. weight lifting; swimming; stationary biking); hip-to-waist ratio was not measured. **Identified by the researcher:**

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
						motivated to change behaviour after diagnosis of breast cancer, they may experience barriers that restrict them from making the desired changes (e.g. weight status). Health events may not lead to behaviour changes. Interventions should be implemented early in the post treatment period.	
Tang, Oakley, Dale, Purushotham, Møller& Gallagher (2014)	To assess the acceptability and impact of a brief smoking cessation intervention during the first consultation visit for patients referred with suspected head and neck cancer	UK, England	N=80 **DEMOGRAPHICS** **Gender:** 59% male	Exploratory, mixed methods	**Smoking outcome:** local arrangements to achieve smoking cessation, already quit, accepted or rejected the service. **Smoking status**	36% of patients quit (at least temporarily). 10% set a quit date or reduced smoking. 10 out of the 11 patients with a positive diagnosis provided evidence of quitting.	**Identified by the author:**lack of a control group; lack of information on spontaneous quit rates; variable time interval between the brief intervention

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						74% reported that the appointment changed the way they felt about smoking. For some (26%) this was enough to make them quit. 36% said that the discussion at the appointment did not influence their decision to stop smoking.7.5% said that the diagnosis influenced their decision, not the intervention. 11% had no intention to stop smoking. Some patients felt the advice worked as a cue to stop smoking. Others felt that it "too much to digest" in one appointment.	and survey interview; self-reported data **Identified by the researcher:**

Teachable moments: Potential for behaviour change among people with Type 2 Diabetes and their relatives

Author and year	Study aim(s) as relevant to the current review	Country	Participants (number and characteristics)	Design	Measure(s)	Results	Study limitations
						Key teachable moment message: The prospect of cancer diagnosis has a large impact on patient's perception of susceptibility to illness. It might be a teachable moment.	