

Which goal adjustment strategies do cancer patients use? A longitudinal study

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Abstract

Objective: A cancer diagnosis may lead to the need to adjust personal goals. This study longitudinally investigates patients' use of goal adjustment strategies with goal characteristics over time. Whether and which goal adjustment strategies are used after cancer diagnosis may depend on the period studied (treatment period or follow-up period) and illness variables such as illness severity.

Methods: Newly diagnosed colorectal cancer patients ($n = 186$) were asked about their personal goals during three assessments (within 1 month after diagnosis and 6 and 18 months after the first assessment). Eight goal adjustment strategies were assessed over the first 6 months (treatment period) and between 7 and 18 months (follow-up period) using goal characteristics. Illness variables were obtained from patients' medical records from the national cancer registry.

Results: Most patients used one strategy per period, and patients most often shifted their priorities across life domains. During the treatment period, more patients formed shorter-term goals than during the follow-up period, while during the follow-up period, more patients formed longer-term goals than during the treatment period. Illness variables were not related to the use of goal adjustment strategies.

Conclusions: The findings show that cancer patients use different goal adjustment strategies and, interestingly, that the use of specific strategies depended on the period after diagnosis but not on illness variables.

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Background

Our everyday behaviours and choices are for the greatest part determined by the personal goals we set and pursue [1,2]. The continuous pursuit and attainment of goals is important to experience a sense of meaning in life [3] and well-being [4] but can be disturbed by the diagnosis of a potentially life-threatening disease as cancer [5,6], possibly leading to a need to adjust goals [6–8].

To date, studies on goal adjustment have mainly focused on so-called general goal adjustment tendencies. They give information on people's ability to disengage from disturbed goals and re-engage into new goals (e.g. [9,10]), either in general or in a specific situation. However, these tendencies are often not related to specific goals and may require patients' ability to recall their actions [11]. Additionally, studies used differences in goal characteristics from the same goals over time to study adjustment (e.g. [7]). However, as these goals may not be relevant anymore at a later assessment, the actual goal dynamics may be missed. Recent studies on goal adjustment have called for the study of concrete goals, in current situations in which goal disturbance could occur, and the employment of longitudinal study designs [7,11,12] to find out if and how people actually

adjust their goals over time and to further our understanding of the specific role of goals in the adjustment process [13]. The current study aims to investigate the use of actual goal adjustment strategies by examining personal goals after a cancer diagnosis, focusing on a large sample of adult cancer patients in a longitudinal setting.

Many theoretical models have proposed specific actions, or strategies, people may use to cope with disturbed goals (e.g. [3,9,15–22]). Based on the large body of literature, as well as a previous study [14], we compiled a set of eight actual goal adjustment strategies that could be used when life-altering situations occur. All goal adjustment strategies imply disengagement and/or re-engagement and, as such, relate to goal adjustment tendencies. However, goal disengagement and re-engagement often occur simultaneously within a strategy (e.g. *scaling back goals* implies small-scale disengagement as well as re-engagement as the goal is let go but replaced by a related one), and therefore, the actual strategies are not directly comparable with the tendencies. In the previous study, we discovered that adolescents with cancer used all strategies implying commitment to important and attainable goals (strategies 1–6 in Table 1) and barely used those implying commitment to disturbed goals

or no commitment at all (strategies 7–8 in Table 1) [14]. We therefore hypothesise that colorectal cancer patients will show a similar pattern. A description of each of these strategies is given in Table 1, first column.

The use of specific goal adjustment strategies can be assessed by investigating goal characteristics over time. Goal characteristics refer to the categorisation of goals according to their content and structure. *Goal content* gives information on what the goal is about, that is, referring to

life domains such as physical and social relationships [23,24], and their level of abstraction (high, e.g. *Try to live a healthy life*, to low, e.g. *Go to the gym every day*) (derived from [1,25–27]). *Goal structure* refers to specific values that respondents attach to goals regardless of their content, that is, how important or attainable a goal is or the amount of effort invested to attain that goal [1,24,28]. The scoring formulas for each strategy were developed using those characteristics important for defining their use (see Table 1, second column).

Table 1. Descriptions and operationalisations of goal adjustment strategies

Description	Operationalisation
1. Shifting priorities across domains Changing one's orientation from one life domain to another. For instance, shift focus from work-related goals to social goals.	Number of goals scored 8 (on a scale ranging from 1 to 10, with 10 indicating highest importance) or higher on importance in one domain decreases over time by at least 0.5 SD, while the number of goals scored 8 or higher on importance in another domain increases by at least 0.5 SD (cut-offs based on pooled SDs).
2. Scaling goals back in the same life domain Adopting a more specified and concrete goal over time in the same life domain as the previous goal. For instance, shift from the goal 'getting an education' to 'registering for a course', both in the achievement domain.	Mean abstraction level score (on a scale ranging from 1 to 4, with 4 indicating very abstract goals) per domain decreases over time by at least 1 point.
3. Scaling goals up in the same life domain Adopting a more vague and abstract goal over time in the same life domain.	Mean abstraction level score per domain increases over time by at least 1 point.
4. Form shorter-term goals Adopting goals that are expected to be achieved over a shorter period of time, for instance, weekly swimming with one's grandchildren.	Mean temporal range (on a scale ranging from 1 to 9, with 9 indicating a very long temporal range) decreases over time by at least 3 points (i.e. at least 2 months).
5. Form longer-term goals Adopting goals that are expected to be achieved over a longer period of time, for instance, seeing one's grandchildren grow up.	Mean temporal range increases over time by at least 3 points (i.e. at least 2 months).
6. Give up effort but remain committed/Put goals on hold Not investing effort in a goal, but continuing to value it as important. For instance, when one wants to go on a journey abroad but realises that this is not feasible yet, this goal may be put on hold with the expectation to be realised later.	Effort score (on a scale ranging from 1 to 10, with 10 indicating highest effort) becomes insignificant over time, while the importance of the goal continues to be high. Therefore, per domain, there should be a decrease of mean effort score over time of ≤ 0.5 SD AND going from at least a 6 to a 5 AND no decrease in mean importance score over time of more than 0.2 SD AND mean importance score over time should remain ≥ 6 (effort cut-offs 0.5 SD based on pooled SDs T1–T2 for the 1st period and T2–T3 for the 2nd period and importance cut-offs 0.2 SD based on pooled SDs T1–T2 for the 1st period and T2–T3 for the 2nd period).
7. Continue to pursue disturbed goals Keep investing effort in goals that have become difficult to attain, for instance, when one wants to finish a marathon and keeps training, even though this cannot be reached or has become very difficult.	Per domain, there should be no decrease of mean effort score over time of ≥ 0.2 SD AND effort score over time should stay ≥ 6 AND no increase of mean attainability score (on a scale ranging from 1 to 10, with 10 indicating highest attainability) over time of ≥ 0.2 SD AND attainability score over time should remain ≤ 5 (effort cut-offs based on pooled SDs 0.2 T1–T2 for the 1st period and T2–T3 for the 2nd period and attainability cut-offs 0.2 based on pooled SDs T1–T2 for the 1st period and T2–T3 for the 2nd period).
8. Give up goal commitment without adopting a new goal In some cases, it could be perceived that no goals are left that are important or attainable, resulting in no goals left to pursue.	All goals at T2 are rated as insufficiently important, and the total mean importance score at follow-up is lower than at T1. Therefore, per domain, there should be a decrease of mean importance score over time of ≤ 0.5 SD AND all importance scores T2 ≤ 5 (importance cut-offs 0.5 SD based on pooled SDs T1–T2 for the 1st period and T2–T3 for the 2nd period).

SD, standard deviation.

We will investigate the use of actual goal adjustment strategies during two periods after colorectal cancer diagnosis. The treatment period (1–7 months post-diagnosis) is characterised by the diagnosis of cancer and primary medical treatment [29,30]. The follow-up period (7–18 months post-diagnosis) is characterised by coming to terms with early survivorship or end-of-life [29,30]. These differences may influence which adjustment strategies are used. During the treatment period, more patients may scale back their goals than during follow-up. Also, as illness variables, such as severity of prognosis, could influence goal adjustment [7], we will explore whether these variables are related to the use of specific adjustment strategies. For instance, patients with a stoma (and more physical hindrance) may need to scale back goals more.

Methods

Design and participants

Patients who had just received the diagnosis colorectal cancer in one of four participating hospitals in the Netherlands were asked to participate in this longitudinal study with three assessment points (T1, within a month post-diagnosis; T2, 7 months post-diagnosis; T3, 18 months post-diagnosis). Patients who were unable to understand Dutch or had drug-related or alcohol-related problems were excluded from participation. All patients provided informed consent. The medical ethical committee of a university medical centre in the Netherlands approved the study.

Procedure

As soon as possible, after confirmed diagnosis, a physician or a nurse introduced the study to eligible patients and handed them an information letter with informed consent form. After signed informed consent was received, each patient was assigned to an interviewer who visited the patient to conduct the online assessment at all three time points. Figure 1 shows the inclusion flowchart.

Measures

Demographic and illness characteristics

At the first assessment, patients were asked about their age and gender. We obtained data on TNM stage, subtype of cancer (colon or rectum), presence of stoma and treatment from the Netherlands Cancer Registry.

Prognosis: All patients were classified according to their TNM stage. Patients with TNM stages I and II with survival rates of 95% and 84.7%, respectively [31], were combined to form a prognosis group with $\geq 80\%$ chance of survival. Patients with TNM stages III and IV with survival rates of 68.7% and 8.1%, respectively [31], were combined to form a prognosis group with $< 80\%$ chance of survival.

Site of cancer: Patients with colon carcinoma and sigmoid carcinoma were grouped to form the colon cancer group. Patients with rectal carcinoma and anus carcinoma were combined to form the rectal cancer group.

Presence of stoma: Patients with either a permanent stoma or a temporary stoma were combined into a stoma group.

Treatment: Patients who received surgery only were classified into the surgery only group, while patients who also received chemotherapy and/or radiotherapy were classified into the surgery plus additional treatment group.

Goals

To assess patients' goals and obtain information on goal characteristics, a mixed ideographic–nomothetic approach was used (e.g. [1,8,21,24]). The ideographic aspect entailed that in all three assessments, patients were asked to list 3–10 personal goals. They were asked to think about their plans or projects that they were currently working on (based on e.g. [1,8]). These goals were then all categorised independently by two trained raters according to their content, that is, life domain: physical, psychological, social, achievement and leisure (based on [1,25–27]), and level of abstraction: 1 = *very concrete* (e.g. exercise twice a week), 2 = *concrete* (e.g. stay fit), 3 = *abstract* (e.g. be healthy) and 4 = *very abstract* (e.g. be happy; adapted from Carver and Scheier [2]). Initial consensus between scorers was 86.4% for goal content and 75.6% for level of abstraction. Disagreements between raters were resolved by discussion with one of the authors of this paper (M.J.).

The nomothetic aspect entailed that patients were also asked to rate their own goals on the importance they attached to a goal, their appraisal of how attainable the goal was and amount of effort invested to achieve that goal on 10-point Likert scales ranging from 1 (*not at all*) to 10 (*very*) (based on e.g. [1,8]) at all time points. Additionally, each goal was rated on the time frame within which they were expected to be achieved (i.e. temporal range) on a 9-point Likert scale ranging from 1 (*within a week*) to 9 (*more than 2 years*).

Goal adjustment strategies

To study goal adjustment strategies, we used the scores on goal characteristics over time. For each strategy, we determined which characteristics were needed to determine their use (Table 1). All strategies were then calculated based on the operationalisations. A strategy was coded as used when it was used at least once.

Statistical methods

Descriptive statistics were used to investigate the use of strategies, and correlations and chi-squared analyses to test the relation with age and gender. Repeated-measures analyses with time as a between-group factor were used

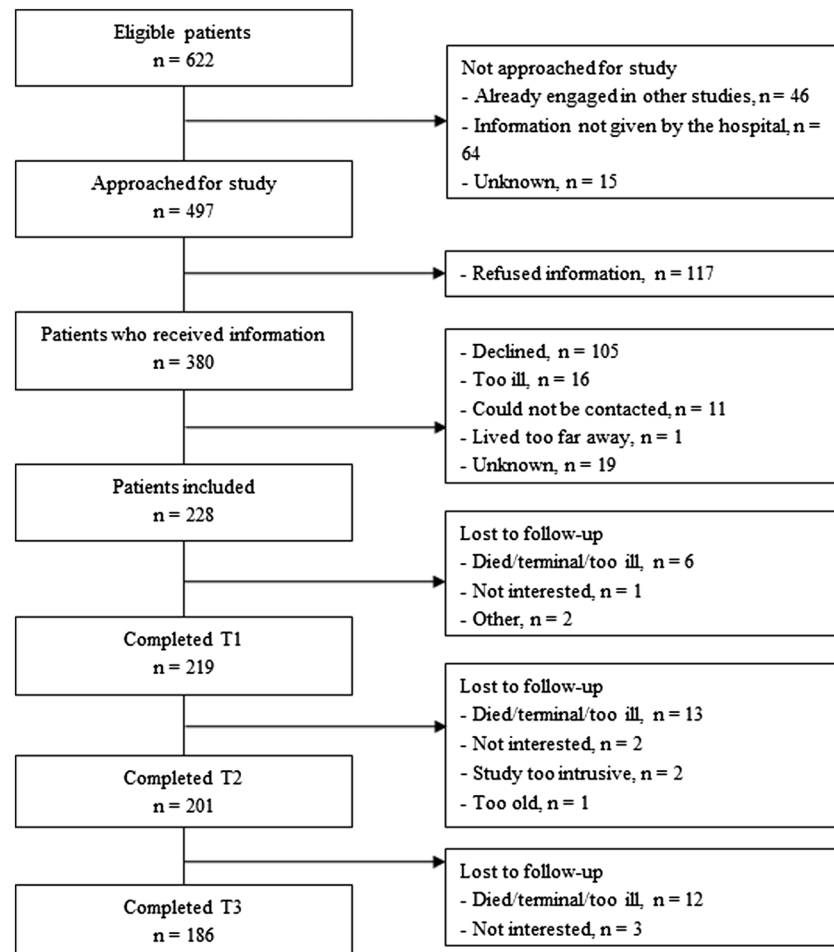


Figure 1. Flowchart of sample recruitment

to check for statistical differences in goal characteristics and the total use of strategies over time. McNemar χ^2 was used to test whether the difference in percentage of strategy use over both periods was significant. To investigate whether the use of goal adjustment strategies was related to illness characteristics, chi-squared tests were used.

Results

Descriptives

Table 2 shows the demographic characteristics of the sample. Of the 186 patients, 10 could not be staged by the TNM classification, and information concerning all illness variables could not be subtracted from the Netherlands Cancer Registry for three patients. Therefore, these 13 patients were not included in the analyses when illness variables were involved.

The use of goal adjustment strategies

Correlational analyses between age and all separate strategies showed no significant results. With respect

Table 2. Patient demographics and illness variables ($n = 186$)

Variable ^a	M (SD)
Age (years)	64.2 (10.8; range 38–93)
Gender (female)	No. (%) 73 (39.2)
Prognosis	
$\geq 80\%$ chance of survival	104 (55.9)
$< 80\%$ chance of survival	69 (37.1)
Stage I	45 (24.2)
Stage II	59 (31.7)
Stage III	56 (30.1)
Stage IV	13 (7)
Site of cancer	
Colon and sigmoid	109 (58.6)
Rectal and anus	74 (39.8)
Stoma (yes)	57 (30.6)
Treatment	
Surgery only	78 (41.9)
Additional treatment (chemotherapy and/or radiotherapy)	101 (54.3)

SD, standard deviation.

^aPercentages may not reach 100% because of missing data.

Table 3. Frequencies and percentages of patients using the strategies (n = 186)

Goal adjustment strategy	Treatment period	Follow-up period	r (p)	χ^2 (p) ^a
1. Shift priorities across life domains	103 (55.4%)	118 (63.4%)	0.08 (0.27)	1.25 (0.12)
2. Scale back goals in the same life domain	33 (17.7%)	25 (13.4%)	-0.02 (0.81)	0.06 (0.32)
3. Scale up goals in the same life domain	42 (22.6%)	47 (25.3%)	-0.05 (0.52)	0.42 (0.64)
4. Form shorter-term goals	18 (9.7%)	5 (2.7%)	-0.05 (0.46)	0.55 (0.01)*
5. Form longer-term goals	9 (4.8%)	65 (35%)	0.06 (0.42)	0.67 (0.00)**
6. Give up effort but remain committed/Put on hold	35 (18.8%)	28 (15.1%)	-0.09 (0.24)	1.42 (0.43)
7. Continue to pursue disturbed goals	0 (0%)	0 (0%)	—	—
8. Give up goal commitment without adopting a new goal	0 (0%)	0 (0%)	—	—

^ap-values are McNemar χ^2 : *p < 0.05; **p < 0.01.

to gender, men tended to use the strategy *Give up effort but remain committed/Put goals on hold* more often during the treatment period than women ($\chi^2=4.86$, $p=0.03$). Table 3 shows the use of strategies over the two periods (i.e. the treatment period 1–7 months and the follow-up period 7–18 months post-diagnosis).

No use of goal adjustment strategies

During the treatment period, 36 patients (19.4%) did not use a goal adjustment strategy, while during the follow-up period, 23 patients (12.4%) did not use a goal adjustment strategy. To check whether we missed any systematic changes in goals with our method, we investigated whether the group who did not use any goal adjustment strategies showed significant changes in goal characteristics over time. Apart from significantly lower levels of mean importance at T3 than at T2 (8.1 vs. 8.9, respectively, $F(1, 22)=8.1$, $p=0.01$), no significant differences were found, supporting our assumption that their goals remained relatively similar over time.

Use of goal adjustment strategies

The group as a whole used significantly more goal adjustment strategies during the follow-up period compared with the treatment period (mean P1 = 1.29, standard deviation (SD) = 0.9, mean P2 = 1.55, SD = 1.0, $F(1, 185) = 7.7$, $p=0.01$). During both periods, of those who used a strategy, the majority used one (P1: $n=83$, 44.6%; P2: $n=71$, 38.2%). Correlational analyses to check overlap in the use of the same strategy over the two periods showed no significant results, indicating that patients tended to use different strategies during each period (Table 3).

At both periods, the strategy that was used most often was *Shifting priorities across domains*. During the treatment period, most decreases in importance were in the social domain and most increases in the leisure domain. During the follow-up period, most decreases were in the leisure domain and most increases in the psychological domain. After that, people mostly scaled their goals up and back and gave up effort but remained committed to

their goals (put their goals on hold). The strategies *Continue to pursue disturbed goals* and *Give up goal commitment without adopting a new goal* were not used during either period in our sample (Table 3).

Most strategies were used equally often during both periods, except for the strategies *Form shorter-term goals*, which was used significantly less often over time, and *Form longer-term goals*, which was used significantly more often over time (Table 3). Additionally, the use of *Scaling up* in the treatment period significantly correlated with *Scaling back* in the follow-up period ($r=0.28$), and *Scaling back* in the treatment period significantly correlated with *Scaling up* in the follow-up period ($r=0.22$). Also, *Putting goals on hold* during the treatment period was significantly correlated with *Shifting priorities* during the follow-up period ($r=0.25$).

Role of illness characteristics

The results of the chi-squared analyses showed that the use of strategies was not related to prognosis, site of cancer, presence of stoma or type of treatment during either period. Only a marginally significant effect was found during the treatment phase for having a stoma: patients without a stoma more often formed longer-term goals than patients with a stoma ($\chi^2=3.78$, $p=0.052$). To make sure that by combining stages I and II and stages III and IV we did not miss any differences in the use of adjustment strategies, we also performed chi-squared analyses with each stage separately, but no significant results were found.

Conclusions

This study set out to investigate the use of actual goal adjustment strategies between two meaningful periods after cancer diagnosis, taking illness variables into account. The results show that the majority of patients indeed adjusted their goals. As hypothesised, all strategies implying commitment to attainable goals were used. The strategy *Form shorter-term goals* was used more often during the treatment period than the follow-up period, while the strategy *Form longer-term goals* was

more often used during the follow-up period than the treatment period. Illness variables were not found to have an impact on the use of goal adjustment strategies.

That most patients are capable of adjusting their goals so that they maintain attainable shows the flexible human nature. Deploying varying goal adjustment strategies to match situational change is an important aspect of flexible coping [32]. That the use of most adjustment strategies remains stable over time could indicate that patients are capable of using these strategies in diverse situations.

Shifting one's priorities across domains was found to be a common response to a cancer diagnosis. This could be due to cancer being a life-altering event, causing changes in opportunities for goal pursuit and outlook on life. Previous research already showed that other life domains could become important after cancer diagnosis, for instance, health [8] and social relationships [33], and that patients change the importance of life values to adapt to an illness such as cancer [34]. Also, shifting goals across domains can refer to a type of response shift, where different goals have become important [18,35].

The absence of the use of strategies implying commitment to disturbed goals or no commitment at all (*Continue to pursue disturbed goals* and *Give up goal commitment without adopting a new goal*) may indicate that cancer patients adapt well and do not keep investing effort in goals that are difficult to attain. This finding is in line with the assumption that people usually do not engage in goals that are unattainable to begin with [2]. It could be that the current sample is relatively healthy and has no need to use the two aforementioned strategies. However, patients included in our study with stage IV cancer, and who thus had a limited life expectancy, also continued to have meaningful goals. Alternatively, patients may report all their goals as attainable, even though this may not be regarded as such from a more objective perspective. Theories assume that strategies implying commitment to attainable goals are beneficial for well-being, in contrast to those implying commitment to disturbed goals or no goal commitment at all (e.g. [2,3,9,10]), but this has yet to be examined. Investigating the adaptive value of flexibly using goal adjustment strategies, and how this differs over time, is therefore an important direction for future research.

One of the main findings of this paper is that the use of the strategy *Form shorter-term goals* diminished and *Form longer-term goals* increased over time. It is perhaps an instinctive reaction to focus on shorter-term goals to increase the chance that they can be attained with the uncertainty of treatment outcomes. A previous study already found that cancer can make life seem less open ended, which can lead to the prioritisation of more short-term goals [33]. Later on, when treatment has ended during the follow-up period, patients may start to face life

and early survivorship [30], and longer-term goals can again receive more focus.

We did not find that illness variables were related to the use of goal adjustment strategies. It could be that strategy use has more to do with the subjective evaluation of the hindrance or consequences of the illness than with the objective illness variables. The marginally significant finding that patients with a stoma more often formed shorter-term goals could be explained by their changing functioning and need to learn to live with a stoma. Returning to life as it was before the onset of cancer may therefore take longer, and forming more short-term goals may be a reaction to this more uncertain view of the future. However, these suggestions require further investigation.

Strengths of this study are the novel approach towards assessing goal adjustment using goal characteristics over time, a large sample size with low drop-out and a longitudinal design. A limitation of the study could be that the operationalisations used are based on our assumptions of the goal strategies and alternative interpretations may be possible. Choosing to define the strategies as we did may have influenced which strategies were identified. Also, given the number of statistical tests, there could be a chance of an inflated type I error. However, given the exploratory and novel nature of the study, a Bonferonni-corrected *p*-value would have been overly conservative.

The method presented here has added to the existing goal adjustment measures by studying actual goals at different moments after a stressor, reducing potential recall bias, and showing concrete actions of how people adjust their goals, within and across life domains. We would encourage interested researchers to use and further develop our method in future goal research.

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Conflict of interest

The authors have declared no conflicts of interest.

Note

1. As was found that sequences were not mentioned and programmes could not be clearly sorted, we excluded sequences and made two new categories, higher and lower programmes, and replaced the original terms by terms that were more accessible: system concept=very abstract, principle=abstract, higher programme=concrete and lower programme=very concrete.

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