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## Original Paper

# Cancer Patients, Doctors and Nurses Vary in Their Willingness to Undertake Cancer Chemotherapy

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Cancer patients' attitude to chemotherapy were compared with those of doctors, nurses and healthy controls. 98 cancer patients, 42 healthy subjects, 44 oncologists, 35 surgeons, 32 oncology nurses and 70 surgical nurses received a questionnaire presenting a hypothetical situation involving a toxic chemotherapy regimen. Each were asked to indicate the minimal benefit with respect to chance of cure, life prolongation and symptom relief they would demand to accept the treatment. The patients and the surgical nurses were most reluctant with regard to the treatment. The subgroup of patients under 50 years which matched the oncologists, surgeons and controls with respect to age, cohabitant status and children were significantly more willing to accept the regimen than the controls and professional groups. Patients under 40 years would accept the toxic treatment with hardly any benefit as chance of cure (7%, median), life prolongation (3 months) and symptom relief (8%). Among the professionals, oncologists were most willing to accept therapy, whereas surgical nurses and surgeons were least willing.

**Key words:** patients, doctors, nurses, chemotherapy, hypothetical regimen, attitudes

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### INTRODUCTION

MORE THAN 60% of patients developing a malignant disease will at some time be candidates for cancer chemotherapy, either with a curative or palliative aim. In cancer treatment, the costs (side-effects) and benefits (antitumour effect) of the therapy must be carefully weighed, particularly in the palliative treatment of incurable cancer patients. For curable malignant diseases, intensive and toxic chemotherapy is often administered to patients even though it inflicts high morbidity.

The value of chemotherapy in the palliation of advanced and incurable tumours has not been clearly established. Until recently, chemotherapy has by some authors [1, 2] been regarded as standard treatment for advanced cancers usually considered resistant to available chemotherapy (e.g. non-small cell lung cancer). In chemoresistant malignancies, new multi-drug regimens have often improved response rates, but any impact on survival has been minimal and has been achieved at the expense of significant treatment-related morbidity [3]. When a toxic treatment is given with palliative intent, patient quality of life (QOL) must be a central issue. Previous studies have shown that the attempts of health professionals or patients' spouses to measure patient's QOL are not always reliable [4–6].

Thus, the decision of whether to use chemotherapy should be based on the patient's own perception of the quality of survival [7–9].

It has previously been shown that cancer patients with similar medical conditions are often treated differently. Besides age [10–12] and socio-economic status [13], characteristics and personal values of the physicians may influence how they inform [14] and treat their patients [15–17]. It has been suggested that physicians' opinion and preference based on personal, non-professional values may to some extent be determinants of professional behaviour [18]. Thus, variation in the proportion of patients who receive anticancer therapies may relate, in part, to differences in opinion concerning the worth of such therapies among doctors [19].

Attitude to chemotherapy was assessed in British cancer patients, healthy controls, doctors and cancer nurses by Slevin and associates [20]. They found that the attitudes varied substantially between the groups. Presented with a hypothetical situation and two hypothetical chemotherapy regimens, the cancer patients would undergo even the most toxic treatment for minimal benefits while the healthy controls were least willing. Groups of professionals placed in between. To our knowledge this is the only study of its kind.

To further illuminate the problems concerning attitudes and personal cost-benefit of chemotherapy, especially in the palli-

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ative setting, we performed a study similar to the British in Norwegians. We aimed to investigate the reproducibility of the British data and to study these aspects in Norwegian groups of cancer patients, oncologists, oncology nurses, surgeons, surgical nurses and a group of healthy subjects.

## PATIENTS AND METHODS

### Questionnaire

In this study, we used a questionnaire describing a hypothetical situation: You have been referred to our oncological unit to receive chemotherapy treatment for a malignant disease. The cytotoxic treatment is a toxic chemotherapy regimen with numerous side-effects and drawbacks such as frequent admissions to the hospital (6 days for a 3 week cycle for a least 6 months), daily needles and i.v. infusions during hospital stays, severe nausea and vomiting, reduced appetite, general tiredness and weakness, and total alopecia.

Given the hypothetical scenario, the subjects were first asked if they under any circumstances would accept the presented anticancer treatment. If they responded positively to this question they were asked to indicate their willingness to receive this treatment in three possible circumstances: (1) when the treatment offered a chance of cure (curative), (2) when cure was not possible, but the chemotherapy offered the chance of prolonged life (palliative), and (3) when treatment was given only to relieve symptoms (palliative).

Equivalent of that of Slevin and associates [20], the subjects were asked to rate the minimal benefit that would make the hypothetical treatment acceptable. For chance of cure and symptom relief, we used linear analogue scales (LAS) ranging 0 to 100%. With regard to prolonging of life, the subject could tick boxes ranging from 3 to 24 months (3 month steps).

### Subjects

The characteristics of patients, controls, doctors and nurses are given in Table 1.

Table 1. Characteristics of the groups

Group	n	Age (mean)	Sex (%male)	Married/ co- habitant (%)	Children (%)	Age youngest child (mean)
Patients	98	55*	55	72	78	24**
Controls	42	37	34§	81	67	12
Oncologists	44	42	78	87	82	10
Surgeons	35	41	80	83	69	9
Oncology nurses	32	29†	0§	50	31¶	7
Surgical nurses	70	35‡	6§	61	64	9
Patients <50 years	30	38	59	77	65	9
Patients <40 years	18	32†	74	89	67	3††

Statistical significance differences between the groups are defined as  $P < 0.05$ .

\* Significantly older than the other groups. † Significantly younger than the other groups. ‡ Significantly younger than the surgeons and oncologists. § Significantly smaller portion of males when compared to the other groups. || Significantly smaller portion of married/cohabitants compared to the other groups. ¶ Significantly fewer with children in this group. \*\*Significantly older compared to the other groups. †† Significantly younger than the other groups.

**Patients.** 160 consecutive, eligible patients were asked to complete the questionnaire of which 61% responded ( $n = 98$ ). Patients were eligible for the study only if (1) they had solid malignant tumours, (2) it was their first admission to our oncological unit, and (3) they had never received chemotherapy previously. All eligible patients were included regardless of whether they were to receive chemotherapy, radiotherapy or non-tumouricidal palliative treatment. The non-responders seemed to be mainly older patients ( $>70$  years) complaining they did not understand the questions and patients severely distressed by their disease. The mean age of the responding patients was 55 years (range 21–81). The median age was similar in the male and female patient groups. The majority of the 98 participating patients had incurable malignancies. The patients represented a wide variety of solid malignant tumours except gynaecological cancers and lung cancers since these patients are not admitted to our treatment unit.

The patients were presented with the questionnaire at registration on the same day they were admitted to the oncology department. They were informed about the questionnaire and invited to join the study by the oncologist in charge of the first physical examination. The patients were informed that participation was voluntary. The questionnaires secured anonymity and were returned to one of the nurses at the department within 24 h.

**Controls.** Questionnaires were delivered to 55 office secretaries or employees at the technical department, at the University of Tromsø. Forty-three controls (78%) responded. The mean age was 37 years (range 25–65). Controls were excluded from the study if they had previously been treated for malignancy ( $n = 1$ ) or had participated in care of close relatives/friends with cancer.

**Oncologists.** Fifty-three oncologists at the Department of Oncology at the Norwegian Radium Hospital, the University Hospital of Trondheim and the University Hospital of Tromsø were asked to complete the questionnaire of which 46 responded (87%). Two responding oncologists had previously been treated for cancer and were thus excluded from the study. The mean age in this group was 42 years (range 31–63). In Norway, as in the other Scandinavian countries, oncologists are specialists in both medical oncology and radiotherapy.

**Surgeons.** Fifty surgeons at the surgical unit at three major hospitals in northern Norway (Tromsø, Bodø and Harstad) were asked to complete the questionnaire. Of these, 36 surgeons (72%) returned completed questionnaires. The mean age was 41 years (range 34–64). One surgeon was excluded from the study due to previous cancer treatment.

**Oncology nurses.** Thirty-five nurses at the Department of Oncology, University Hospital of Tromsø were invited to participate in this study. Thirty-two nurses (91%) returned completed questionnaires. The mean age was 29 years (range 24–50).

**Surgical nurses.** Questionnaires were circulated to 95 nurses at the surgical units at three major hospitals in northern Norway. Seventy-two nurses (76%) returned completed questionnaires. The mean age in this group was 35 years (range 23–58). Two nurses had previously been treated for malignancy and were thus excluded from the study.

**Table 2.** Median scores for surgical nurses, surgeons, oncology nurses, oncologists, controls and cancer patients. The scores represent the minimal benefit to make a hypothetical and toxic chemotherapy treatment acceptable in three circumstances (one curative and two non-curative (palliative))

	Surgical nurses (n = 66)	Surgeons (n = 35)	Oncology nurses (n = 32)	Oncologists (n = 44)	Controls (n = 42)	Patients (n = 89)
Curative						
Chance of cure (%)	40*	25	25	10	20	43*
Palliative						
Prolonging life (months)	12	12	12	6†	9	12
Symptom relief (%)	50	50	50	50	50	50

Statistical significance is defined as  $P < 0.05$ .

\* Significantly higher score than oncology nurses, oncologists and controls. † Significantly lower score than surgeons and surgical nurses.

### Statistics

Statistical analyses were performed by one-way analysis of variance and estimation of least significant distance (Statgraphics®, STSC, Rockville, Massachusetts, U.S.A.). Mean values and median scores were estimated by descriptive statistics. Statistical significance was defined as  $P < 0.05$ .

### RESULTS

Among the patients, 9% (5 males, 4 females) would find the treatment unacceptable under any circumstances. This view correlated to patients' age as follows: 5% <40 years; 6% <50 years; 6% <60 years; 15% >60 years and 28% >70 years. The patients who categorically refused chemotherapy were either without children or their youngest child was older than 35. Furthermore, a significantly larger portion of these patients were living alone. Of 70 eligible surgical nurses, four would not accept the hypothetical chemotherapy regimen whatever situation (three were living alone without children and one married with one child 20 years of age). With regard to the other groups, none refused the hypothetical treatment categorically.

Table 2 shows the median scores for patients, controls, nurses and doctors. The scores represented the minimal therapy benefit that would make treatment acceptable to each subject. The cancer patients and the surgical nurses demanded a significantly larger potential chance of cure to be willing to accept the treatment than the other groups. Furthermore, the surgeons and surgical nurses demanded a significantly greater prolongation of life than the oncologist to accept the treatment. However, the symptom relief benefit scores were similar in all groups.

The patients' scores were associated with gender (Table 3).

**Table 3.** Median scores in female and male patients. The scores represent the minimal benefit to make a hypothetical and toxic chemotherapy treatment acceptable in three circumstances

	Female (n = 40)	Male (n = 49)
Curative		
Chance of cure (%)	50	25
Palliative		
Prolonging life (months)	12	6*
Symptom relief (%)	50	30*

Statistical significance is defined as  $P < 0.05$ .

\* Significantly lower score.

The male patients were significantly more willing to accept the intensive and toxic chemotherapy than their female counterparts when assessing scores for prolonging life and symptom relief. With regard to chance of cure, the male patients demanded 25% while the females demanded 50% ( $P > 0.05$ ). Between the sexes, there was no statistically significant difference concerning age, education, marriage/cohabitant status, prevalence of children, or age of youngest child. Male controls were significantly more willing to accept chemotherapy than the female controls with regard to chance of cure, 7.5 and 25% respectively whereas the median scores for prolongation of life and symptom relief were identical.

Since the control subjects and the professionals were significantly younger when compared to the patient group, we studied age-related subgroups of patients (Table 4). Median scores for chance of cure, prolongation of life and symptom relief were all correlated to age. Patients under 50 years (mean 38 years) were significantly more willing than controls and professionals to accept intensive chemotherapy treatments for a potentially small benefit. Moreover, patients under 40 years (mean 32 years) demanded insignificant benefits even in the hypothetical palliative setting. However, there were no statistically significant differences between these two groups. Additionally, patients with children under 10 years ( $n = 13$ , mean 34 years) gave median scores (chance of cure 5%, prolongation of life 3 months and symptom relief 10%) comparable to the group of patients under 40 years. In the latter group, however, none refused the hypothetical treatment. The group of patients under 50 years

**Table 4.** Median scores in patient subgroups related to age. The scores represents the minimal benefit to make a hypothetical and toxic chemotherapy treatment acceptable in three circumstances

	All (n = 89)	>60 years (n = 33)	<50 years (n = 30)	<40 years (n = 18)
Curative				
Chance of cure (%)	43	50	10*	7*
Palliative				
Prolonging life (months)	12	12	6*	3*
Symptom relief (%)	50	50	20*	8*

Statistical significance is defined as  $P < 0.05$ .

\* Significantly lower score than patients >60 years and the total patient group.

was comparable to the groups of controls, surgeons and oncologists with regard to age, marriage/cohabitant status, prevalence of children and age of youngest child (Table 1), whereas the subgroup of patients under 40 years was somewhat younger and had significantly younger children.

The median scores of the oncologists, controls, oncology nurses and surgeons fell between the responses of the surgical nurses and the subgroup of patients under 50 years. In comparison to the oncology nurses, controls and oncologists, the surgical nurses were significantly more sceptical towards the intensive treatment in the curative setting. Moreover, both surgeons and surgical nurses were less likely than oncologists to accept the hypothetical chemotherapy. Surgical nurses with small children (under 10 years) demanded a significantly smaller chance of cure (20%) when compared to those without children or with children older than 10 years (50%). For the other professional groups, the scores were statistically equal regardless of marriage/cohabitant status and prevalence/age of children.

Among the professional groups, the most willing to accept radical treatment were the oncologists followed by the oncology nurses. Score-wise, the healthy controls were significantly more reluctant with regard to the hypothetical chemotherapy treatment when compared to a matched subgroup of patients (<50 years).

## DISCUSSION

During the last two decades, patients have been increasingly participating in medical decision-making and the patients have welcomed the opportunity to be included in this process [21]. However, situations that call for decisions to be made about administration of anticancer chemotherapy are often stressful for both patients and physicians. While the patients need sufficient information to make an informed decision, some doctors are concerned that detailed information will lead to despair and remove all patients' hope. Instead, helping patients become well informed actually assists many patients in sustaining hopeful attitudes [21].

The task of patient information will, to a large degree, depend on whether the cancer treatment has a curative or palliative aim. When the cytotoxic treatment is administered with palliative intent, as it is for the majority of patients (80–90%), both the patients' and the physicians' personal values are of great importance in reaching a decision about whether to start or proceed with chemotherapy. There may, however, be major interindividual variability with regard to personal attitudes of both patients and doctors. Furthermore, data show that personal values of the physician influence the given information and thus affect the patient's decision-making process [14, 15].

To assess both patients', doctors' and nurses' attitudes to chemotherapy, we established a hypothetical framework. This was done to avoid demoralising the patient and provided an opportunity to use doctors, nurses, and healthy volunteers as patient surrogates. The answers given by surrogate patients are of course hypothetical, and imaginary situations lack the emotional dimension present in a real illness. However, Fost [22] argues that the surrogate is able to reflect more carefully on his predicament than the patient who may be too frightened to think and certainly cannot be expected to carry out a difficult cost-benefit analysis.

In contrast to the study of Slevin and associates [20], where only patients admitted to chemotherapy treatment were included, we avoided bias in the patient group as the questionnaire was delivered to every new cancer patient regardless of

planned therapy. The patient group may thus be representative of the entire population of cancer patients that is admitted to our department. The patient and professional groups were compared to a group of healthy individuals. Except for a preponderance of females, the control group matched the groups of oncologists, surgeons and patients below 50 years of age with regard to age, married/cohabitant status, prevalence of children and age of youngest child.

In the literature, there are no available data on refusal of chemotherapy treatment. In this study, we found that 9% of the patients categorically refused chemotherapy and the prevalence of refusal increased with age. In addition, four surgical nurses, but none within the other groups of professionals questioned, declined the hypothetical treatment. Interestingly, the subjects that refused treatment were either living alone, married/cohabitant without children, or with children older than 20 years. Inconsistent with our findings, Slevin and associates [20] did not have any patients that declined chemotherapy. This difference is probably due to bias in their patient group as delineated above.

Contrary to the study of Slevin and coworkers [20] in which the patients (median age 60) were significantly more willing than the doctors, nurses and healthy controls to undertake chemotherapy, our study showed that the patients (mean age 55) and the surgical nurses were the least willing to accept chemotherapy. One may speculate if socio-economic or cultural differences in our two countries may contribute to the gross discrepancy regarding attitudes to chemotherapy. More likely, however, the difference may be explained, at least in part, by selection in the London study. Further, our data showed that willingness to accept toxic chemotherapy for an insignificant benefit such as chance of cure, prolongation of life and relief of symptoms were inversely related to age. This corroborates the data presented by McNeil and associates [23] indicating that older patients with life-threatening diseases often prefer treatment with lower 5-year survival, but a smaller chance of complications of the treatment. Meanwhile, the significantly higher acceptance rate for toxic chemotherapy among patients below 50 years of age (especially those below 40 years) when compared to all the other study groups, indicate that young patients are willing to accept any treatment with hardly any hope of effect. Moreover, patients with children under 10 years of age, when compared to the younger group of patients under 40 years (mean 34 versus 32 years), seemed to be as willing to accept toxic chemotherapy regimens. We also showed that attitudes to chemotherapy, to some extent, are associated with gender as the female patients were significantly less willing to accept radical treatment when compared to males. Mackillop and coworkers [24] found that female doctors in a hypothetical setting were less likely than the male counterparts to undertake aggressive treatment for lung cancer, while our data showed no difference between male and female doctors. We did not investigate subgroups of patients with respect to gender since the limited number of patients would make statistical calculations difficult.

Among the groups of professionals, we found significant differences in attitudes to chemotherapy treatment, with surgical nurses being the least and the oncologists the most likely to accept treatment. Nurses are, in general, more reluctant to accept chemotherapy than doctors. In a recent study, where 621 nurses completed a questionnaire, the majority felt that chemotherapy had the greatest negative impact on patients' quality of life [25]. Surgeons tended to be less willing to accept chemotherapy than the oncology nurses. In a previous study where the attitudes of medical oncologists, radiation oncologists

and surgical oncologists toward different routine and experimental cancer therapies were assessed, the surgical oncologists were also less inclined to accept chemotherapy than the medical oncologists [19]. A possible explanation might be that they assess the risk/benefit ratio of chemotherapy differently than do their colleagues. Other studies have also demonstrated that doctors differ in their stated willingness to accept treatment for malignant diseases [24, 26, 27]. Mackillop and associates [24] asked 118 Canadian physicians about their preferences for treatment if they were to be diagnosed with non-small cell lung cancer. Surprisingly few of the physicians would accept chemotherapy, a therapy which at that time was routine treatment according to major oncology textbooks [24]. In a study of 51 oncologists, Lind and coworkers [19] showed that in only 37% of 30 hypothetical situations involving standard therapy did more than 85% of the doctors agree that they would accept or refuse the therapy. Since doctors' attitudes to chemotherapy vary substantially, the chance is that the various attitudes may affect referral patterns and hence influence the treatment and follow-up of cancer patients.

Doctors are often criticised for being overenthusiastic about offering patients intensive treatment when the risk/benefit ratio is rather high. In contrast, we have shown that some patients will accept highly toxic chemotherapy regimens with only minimal hope of benefit. Today, many oncologists find themselves struggling between some patients' intense demand for treatment and his/her own fear of overtreating the patient. The substantial differences in attitudes to chemotherapy within the patient group, between patients and therapists, and between the professional groups will, particularly in the palliative setting, constantly challenge our professional integrity.

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