Abstract

Effect-Typology and Work Ability Index: Evaluating the Success of Health Promotion in Elder Workforce

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Objective. Changes in work ability and work interest (meaning) after the participation in a health promotion programme were perceived and evaluated.
Methods. Drivers of the Munich Transport Authority (n=122) of an average age of 50 years participated in 20 health days during working time over one year. The evaluation instruments of the health promotion programme were the Work Ability Index developed by the Finnish Institute of Occupational Health (FIOH) and the Effect Typology developed by the Institute of Occupational Health Promotion (IBG Austria).
Results. No changes were found in the WAI score. The Effect Typology evaluated the optimal effect "evolution", i.e. psychobiological and noetic (mental) changes, for 50% of the participants. A Variance Analysis of the WAI pre-post-differences according to the effect classes of the Effect Typology showed significant differences, namely an increase in the WAI in the evolution group and a drop in the recovery group.
Conclusions. The Effect Typology is suitable for the evaluation of occupational health promotion and for the further understanding and development of the Work Ability Index.

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1. INTRODUCTION

In our evaluation research of occupational health promotion we have used the Work Ability Index (WAI) of the Finnish Institute of Occupational Health (FIOH), an evaluation questionnaire which assesses the individual ability to cope with work demands (Tuomi et al., 1994) and bears a high predictive potential for early retirement and death (Ilmarinen et al., 1997). We also focussed on the dimension work interest under which we understand interest in the working life in general and in one's personal development at work.

2. NOETIC DYNAMICS AND THE "EFFECT TYPOLOGY" OF OCCUPATIONAL HEALTH PROMOTION

2.1. Noetic Dynamics

Our hypothetical model is based upon the "Existence Analysis" of Viktor Frankl (1987), an anthropological and psychotherapeutic method which is highly useful for "salutogenic" research in occupational health promotion and ergonomics.

Frankl defined two salutogenic paradigms, which are of relevance for our research work:

1. Meaning (interest, challenge) in life as basis for psychobiological health, as an existential prerequisite, which is defined as the "realisation" of one's personal values. Values are defined as the best choice for oneself in a given situation.

2. The noetic dynamics, as the third dimension in a three-dimensional concept of man and human life (biological- psychical- noetic dimensions)

The noetic dynamics are defined as the specific human abilities to find meaning, take over responsibility, make decisions, adopt personal attitudes to reality, the ability to cope with oneself, to change and develop. Therefore, the impact of work on somatic health and psychical well-being does not only depend on external working conditions (psychobiological impact), but also on internal attitudes like meaning or interest in work (noetic dynamics). Occupational health promotion, participation, focus groups, training programmes, et cetera, are processes that induce noetic dynamics by supporting the development of interests and interpersonal relations at work. In order to increase the rate of older employees at work and decrease early retirement or illness, we have to improve their work ability and their interest in work.

2.2. The ”Effect Typology”: Theory and Methods

Occupational health promotion influences health and wellness, which are subjectively experienced. Accordingly, the quality of a health promotion programme can be measured by evaluating subjective effects. With our “Effect Typology” (ET) we have tried to define subjective effects of health promotion programmes on the basis of the bio-psycho-noetic model of human life, and to measure the quality of occupational health promotion by its salutogenic effects. We have defined a qualitative hierarchy (recovery – relaxation – evolution) of the health effects of an occupational health promotion programme.

Tab. 1: The structure of the “Effect Typology” of occupational health promotion

EFFECT QUALITY	Regeneration of psychobiological resources	Development of psychobiological resources & skills	Induction of noetic dynamics
Recovery	✔		
Relaxation	✔	✔	

Evolution	✔	✔	✔

The optimal occupational health promotion strives to achieve all three effects.

With the ET we also want to predict whether the effects of occupational health promotion on somatic and psychic health are of short, medium or long term (1994).

Tab. 2: The duration of effects of occupational health promotion

QUALITY	DYNAMICS	DURATION
Recovery	**Regeneration** of psychological and somatic resources till reaching the original level again after finishing work demands and work effort *(day off, vacation, absenteeism, sick leave, etc.).*	Short term
Relaxation	**Relief** from stress, exhaustion and tension **by increasing** psychobiological resources and psychosocial skills beyond original level through training, exercise, redesign or change of habits *(stress management, physical strength, ergonomic exercises, stretching, diet counselling, deneuroticising).*	Medium term
Evolution	**Induction** of health potentials through development of meaningful and interesting work relations, responsibility, freedom of decision, and a salutogenic way of dealing with oneself.	Long term
Involution	Stress, aversive emotions and somatic reactions caused by an incompatibility between the person concerned and the health promotion programme	?

During the run of a programme also stagnation or involutional dynamics followed by deterioration of health, work ability and well-being can be observed. Therefore a category of deterioration (involution effects) has been defined.

3. SUBJECTS AND METHODS

The Characteristics of the Driver Population: The health promotion programme has been established by the Munich Urban Transportation Authority (MVB) for elderly drivers. Bus, tram and subway drivers of over 45 years of age and with seniority at MVB can optionally participate. So far 122 workers of a mean age of 50 and with an average of 23 years of work experience have participated, women accounting for 6 % and men for 94 % of the participants.

The health programme is run in the Münchner Gesundheitspark by professional trainers and is directed by B. Ertl (med. supervisor M. Schmid-Neuhaus). The programme is carried out annually (January to December) since 1993. It consists of 20 full-paid health days, one 8-hour day every two weeks during working hours. The participation in the programme is organised in groups of 16 drivers and 1 permanent qualified psychological trainer. The programme elements are physical and psychological training, stress management, social skills and diet counselling. The cut off of this study was by participation less than 18 out of the 20 health days.

Evaluation through Work Ability Index and Effect Typology Questionnaire: The individual effects of the programme on work ability, work interest and health have been evaluated in a pre-post-comparison in January and December by means of the

- Work Ability Index (FIOH)
- Effect Typology Questionnaire (IBG Austria)

Work Ability Index. The WAI consists of 7 items with a total score of 49 and a 4-class classification of work ability.

Effect Typology Questionnaire. The ETQ consists of 7 items with a total score of 14 and a 4-class typology of occupational health promotion. The Effect Typology was evaluated in January one year before the Munich programme (placebo year) started and in December of the year when the programme was run (intervention year). The ETQ is being improved continuously and validated with data on health, stress and professional performance (Karazman et al., 1997). For the statistical analysis different calculations are used: t-test, ANOVA, correlation (PMK, chi-square).

4. RESULTS

122 out of 193 participants filled in both questionnaires completely, thus were considered.

Evaluation by the Work Ability Index: With the WAI, the average total score of 50-year old drivers was 37. After the health promotion programme a slight increase of 37.3 points (statistically not significant) on the average could be registered; When assigning the drivers' work ability to the 4 classes of work ability on basis of the WAI score, slightly more than the average showed a better work ability, but one third had only a moderate work ability and 7 percent even a poor one. After the programme the work ability slightly improved: 3 percent of drivers shifted from the below-average classes to the good and high ones.

Results of an Evaluation by Effect Typology: The Effect Typology was evaluated in the year before the programme (placebo year) and in the year during the programme (intervention year). In the ET evaluation year the ET quality of 60 percent of the participants improved, and above all the group who perceived a "(high) evolution" grew from 9 to 48 percent. The placebo-programme comparison by the Effect Typology showed a statistically significant difference between both ET years, so that we may conclude that the programme resulted in an improvement of the health, well-being and interest in work for a majority of participants.

Tab. 3: The "Effect Typology" before (PLACEBO) and after the programme

EFFECT QUALITY	Effect Typology BEFORE	**Effect Typology AFTER**
High evolution	1.8 %	**14.0 %**
Evolution	7.0 %	**33.4 %**
Relaxation	55.3 %	**37.7 %**
Recovery	30.7 %	**12.3 %**
Burden	5.3 %	**2.6 %**

Chi-square test : p=0.000

In a single-item analysis of the 7 items of the Effect Typology, we could see that especially the noetic dimensions, as meaning in private life, personal dynamics and self-awareness potential had improved.

Co-evaluation by Work Ability Index and Effect Typology: The evaluation of the programme by means of the Work Ability Index showed no change in the WAI scores of all participants. In the next step, we, therefore, investigated whether the Effect Typology showed any significant deviations from the WAI scores. Results supported our hypothesis: the participants in the "evolution" group increased their WAI scores by 2 to 3 points, whereas the "relaxation" group remained at the level of January and the scores of the "recovery" group dropped by 3 points. While the WAI differences between the effect qualities were not statistically significant in January they had become so by December (measured by ANOVA).

Tab. 4: WAI scores according to the effect types of "Effect Typology"

QUALITY	WAI January	WAI * December	WAI Difference
Total WAI score	*37.0*	*37.5*	*+ 0.5*
High evolution	38.9	40.9	+ 2.0
Evolution	36.9	38.5	+ 1.6
Relaxation	37.8	37.4	– 0.4
Recovery	34.5	31.9	– 3.4
Involution	32.7	30.7	– 2.0
ANOVA	n.s.	p=0.0000	

The single-item analysis shows that the screening potential of the ET for the WAI total score is mainly based on items 1 and 7 and partly on items 2 and 4.

Tab. 5: Single Item Analysis of WAI and ET

WORK ABILITY INDEX & EFFECT TYPOLOGY Scores of the single WAI items on basis of ET / December					
WAI items	**High**	**Evol**	**Relax**	**Rec**	**Invol**
TOTAL WAI SCORE	***40.9***	***38.5***	***37.4***	***31.9***	***30.7***
1. Current work ability compared with the lifetime best	7.9	7.5	7.2	5.2	4.3
2. Work ability in relation to the demands of the job	8.6	7.8	7.5	6.8	5.8
3. Estimated work impairment due to diseases	5.3	5.3	5.3	4.9	5.0
4. Sick leave during the past year (12 months)	4.0	3.7	3.8	2.9	2.5
5. Own prognosis of work ability two years from now on	6.4	6.5	6.6	5.0	4.8
6. Number of current diseases	4.6	4.4	4.2	3.4	4.3
7. Mental resources	3.3	3.1	3.0	2.7	1.5

The number of diseases (item 6) as well as the impairment of work due to diseases (item 3) seem to be invariant in spite of the salutogenic effects of the health promotion programme. Partly, this should be no surprise as the programme offers neither therapy nor rehabilitation.

Thoughts on early retirement: Thoughts on early retirement have proved to be an indicator of early retirement (Huutanen P., 1992). Arising thoughts are already a sign of decreasing interest in work. In the participants with an ”evolution” effect the thoughts on early retirement decreased the strongest during the programme. The less noetic dynamics had been induced during the programme, the stronger did thoughts on early retirement increase.

5. DISCUSSION

The Munich health promotion programme proved to bear a high salutogenic potential. Not only did the psychobiological parameters of health, well-being and work ability improve in the majority of participants, but also work interest, personal development and noetic dynamics. This concurrence of psychobiological and noetic changes, evaluated by the Effect Typology in the majority of participants, is called “evolution” effect. Participants with such an “evolution”

effect show a significant increase in the WAI score and a decrease in thoughts on early retirement. In participants with only an improvement of the psychobiological parameters ("relaxation" or "recovery") in our Effect Typology the WAI score dropped and thoughts on early retirement rose during the programme. This coincidence of evolution effect, WAI increase and decreasing thoughts on early retirement support our hypothesis that the synergy of improved work ability and increased work interest, i.e. the synergy of psychobiological and noetic dynamics, is a prerequisite for keeping (elderly) workers in the work process.

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