Summary

Regime and stress in detention. A pilot study in Nieuwegein Prison in the Netherlands

Introduction

The present study was conducted to evaluate a pilot experiment (2017-2018) with a change of regime in Nieuwegein Prison (PI Nieuwegein) in the Netherlands. The intended effect of the regime change is improvement of the living conditions, by increasing the autonomy of detainees and by improving the possibilities for contact of detainees with the outside world. Specifically, the measures entail that detainees can move relatively freely within the prison with their own keycard, have a key to their cell and receive visitors in a more hospitable visitor's room.

The Custodial Institutions Agency (Dienst Justitiële Inrichtingen – DJI) requested the Scientific Research and Documentation Centre of the Ministry of Justice and Security (Wetenschappelijk Onderzoek en Documentatiecentrum – WODC) to investigate the effects of these changes in the prison regime. Two sub-projects were conducted. One sub-project was outsourced by the WODC to Tilburg University. That study focused on the relationship between the prison regime on the one hand and the behavior and health of detainees on the other.

The current study was conducted by WODC and focuses on the relationship between prison regime pilot experiment and stress in detainees and prison officers. The objective of this study is twofold: Firstly, to describe levels of self-reported stress, self-reported psychological complaints, and levels of the stress hormone cortisol in the hair of detainees and staff. Secondly, to investigate the effect of the new prison regime on levels of stress and psychological complaints of detainees and correctional officers. The research questions are:

1 What are levels of stress and psychological complaints in the detainees and correctional officers under study, and how do these levels compare to those of other populations?
2 Is hair cortisol associated with self-reported stress and psychological complaints among the detainees and correctional officers under study?
3 To what extent do stress levels of detainees and correctional officers in the unit with the experimental prison regime differ from those of detainees and correctional officers in a control unit with the regular regime?
4 To what extent do the stress levels of detainees in a restricted (so called 'basic') regime differ from those of detainees a less restricted (so called 'plus') regime? Both units participating in the study house detainees who individually fall under a 'basic' regime and detainees who individually fall under the 'plus'-regime. Plus regime-detainees have inter alia more freedom to participate in activities.

Method

Research design

Two prison units with a capacity of 84 and 88 places respectively took part in the study. Participants in the study were both detainees and prison correctional officers. Baseline measures were collected in both units when they still both the regular prison regime. Subsequently, in one of the two units (the experimental unit) a new regime was introduced while in the other (the control unit) the regime was not changed. Approximately three months after the experimental regime was fully implemented on the experimental unit, a post-measurement was performed in both units. This took place about a year after the baseline measurement. The aim was to conduct a study with repeated measures: a baseline and a post-measurement in each participant. Due to the relatively rapid release or transfer of detainees, this turned out not to be feasible. As a result, there were largely different groups of participants in the baseline and post-measurements.

In the descriptive part of the study, only data were used from participants who were not (yet) exposed to the experimental prison regime. This included all participants in the baseline measurement (both the control and experimental condition) and new participants from the control group in the post-measurement.

Measurement of stress and psychological complaints

Self-reported stress levels among detainees and correctional officers were assessed by asking them to indicate to what extent they had suffered from stress in the previous month on a ten-point scale. Furthermore, the levels of the stress hormone cortisol in the hair were investigated. A 1 cm hair sample, cut directly from the scalp, was used. This sample contains cortisol that was excreted in the preceding month and provides a proxy of the activity of the biological stress system during that period. Self-reported psychological complaints were measured with the revised Symptom CheckList-90 (SCL-90-R). Data about general characteristics and potential confounders of the stress measures were collected by means of a questionnaire. Participants who used corticosteroid medication were excluded from the study, because such medication is likely to affect the cortisol level in the hair and possibly self-reported stress measures.

Results

Number of participating detainees and correctional officers

A hundred and ten detainees took part in the baseline measurements (67 experimental group, 43 in the control group), and 108 (47 experimental group, 61 control group) in the post-measurement. These 218 observations pertained to 199 unique participants. Of these participants, 98 had a complete set of data (general characteristics, SCL-90-R data, hair sample, and medication).
Twenty correctional officers took part in the baseline measurement (15 experimental group, 5 in the control group) and 20 in the post- measurement (11 experimental group, 9 in the control group). These 40 observations in total were made with 32 unique participants, 15 of whom had a complete set of data.

Description of the degree of stress and psychological complaints among detainees and correctional officers

What are the levels of stress and psychological complaints in the detainees under study, and how do these compare to those of other populations?

Detainees differed greatly in the degree of stress they experienced in the previous month. Detainees in the basic regime experienced more stress than detainees in the plus-regime. There was a positive relationship between self-reported stress and experiencing a stressful event in the previous month and between self-reported stress and use of benzodiazepines. Detainees reported less stress the longer they had stayed in PI Nieuwegein.

Detainees reported more psychological complaints compared to a reference group of men from the general Dutch population, especially depressive complaints and sleeping problems. However, the scores of the detainees in the present study were more favorable compared to scores from other research with Dutch detainees. The degree of self-reported psychological complaints correlated positively with the experience of a stressful event in the previous month, and negatively with the extent to which a detainee participates in sports.

After exclusion of statistical outliers (hair cortisol higher levels than 14 pg/mg), the hair cortisol levels of the detainees in this study were comparable to those found in other studies in adult male populations. However, relatively high hair cortisol levels were found in a number of detainees in the present study (up to more than 200 pg/mg). Compared with reference data, of the group of detainees including outliers 8% had low hair cortisol-levels (up to 4 pg/mg), 77% medium levels (4-15 pg/mg) and 15% high levels (more than 15 pg/mg).

What are the levels of stress and psychological complaints in the correctional officers under study, and how do these compare to those of other populations?

Approximately two thirds of the small group of correctional officers scored relatively high on self-reported stress, one third of the group scored relatively low. Self-reported stress correlated positively with experiencing a stressful event in the previous month and with BMI.

The extent to which correctional officers reported psychological complaints was comparable to that of a reference group of men from the general Dutch population. However, correctional officers in this study reported more sleeping problems than the reference group. There was a positive relationship between self-reported psychological complaints and experiencing a stressful event in the previous month. Hair cortisol levels of correctional officers were comparable to hair cortisol levels measured in adult men in other studies. In the present study, the average hair cortisol-level of staff was statistically significantly lower than that of prisoners and without statistical outliers. Compared to reference data, about a quarter of the correctional officers had low hair cortisol-levels (up to 4 pg/mg) and medium levels (4-15 pg/mg) were found in about three quarters of the participants.

Is hair cortisol associated with self-reported stress and psychological complaints among the detainees and correctional officers respectively?

No associations were found between hair cortisol levels and other stress measures, neither in the detainees nor in the prison staff group. However, self-reported experienced stress and self-reported psychological symptoms were strongly correlated.

Stress and psychological complaints in relation to prison regime

A priori comparability of study groups

In order to investigate whether the experimental prison regime has an effect, it is important that the experimental group and the control group are comparable in advance. Otherwise, it will be unclear whether observed differences between the groups in the post-measurement should be attributed to effects of the experimental manipulation or to pre-existing differences between the groups. Among the detainees, differences in some of the characteristics, although not statistically significant, were considerable on the basis of the effect size. There was a significant a priori difference in hair cortisol level between the experimental and the control group in the pre-measurement. There was also a significant difference in hair cortisol level between the control groups in the pre- and post-measurement, respectively. Among correctional officers in all three outcome measures, relatively large effect sizes were found in the comparison between the control groups in the pre- and post-measurement.

To what extent do stress levels of detainees and correctional officers in the unit with the experimental prison regime differ from those of detainees and correctional officers in a control unit with the regular regime?

No effects were found in detainees or correctional officers of the experimental regime on self-reported stress, self-reported psychological complaints or on the level of the stress hormone cortisol in the hair. Differences were found however between the pre- and post-measurements in hair cortisol of detainees (higher cortisol levels in mainly the control-group in the post measurement). Differences between the pre- and post-measurements in self-reported stress and self-reported psychological complaints were found in correctional officers (less stress or complaints in the post-measurement in both the experimental group and the control group). This is probably due to the fact that the groups of detainees and correctional officers who took part in the pre-measurement consisted of other individuals then the groups who took part in the post-measurement.

To what extent do the stress levels of detainees differ in the basic regime and the plus-regime, respectively?

Based on correlations reported in the previous paragraph, the self-reported stress-scores of detainees in the basic regime were statistically significantly higher than in those in a plus-regime. However, when basic/plus-regime is introduced as a covariate in the regression-analysis to investigate the effect of the new experimental regime, the association with self-reported stress is (marginally) no longer statistically significant. There was no difference between individuals in basic or plus-regimes in self-reported psychological symptoms or hair cortisol levels.

Conclusions and recommendations for practice and future research

Conclusions

1 No effect of the experimental regime was found on the level of the stress hormone cortisol in the hair, on self-reported stress nor on self-reported psychological complaints among detainees or correctional officers. It is possible that the living climate measures taken are not sufficient to lead to a change in mental or physical health. However, the failure to find such an effect may instead have been caused by limitations in the research design. Due to the high outflow of detainees between the pre- and post-measurement, it was not possible to achieve the intended repeated measurements. The capacity of the departments that participated in the regime experiment was also limited in numbers of detainees, but especially in numbers of correctional officers. As a result, the statistical power, especially without repeated measurements, was not optimal.
2 Based on correlational analysis the self-reported perceived stress in detainees in the basic regime was higher than that of detainees in the plus-regime. This could be a selection effect. Detainees in the basic regime may have more stress in advance because they have more problems, but it could also be that the basic regime contributes to stress, for example because detainees spent more of their time without any activities, or a combination of both.
3 Relatively high scores with regard to self-reported stress and sleeping problems were found among correctional officers and in some of the detainees, and a higher BMI in correctional officers who experience more stress. However, the numbers of participants are too small for strong conclusions about this. We do however see this as a point of attention for practice and for future research. From the broader literature on stress and burnout among correctional officers it is plausible that the profession of penitentiary institution worker entails relatively much work-related stress compared to many other jobs.
4 The scientific literature indicates that biological measures, including (hair) cortisol, heart rate, heart rate variability and skin conduction, have an additional value in detecting potentially harmful stress, and in (preventive) interventions to prevent or reduce harmful stress. Recent studies illustrate this among detainees and penitentiary institution workers. However, it must be taken into account that the application, analysis and interpretation of these physiological measurements require specific knowledge and expertise.
5 This study describes for the first time hair cortisol levels of male detainees. The study thus contributes to the broader development of knowledge about hair cortisol in special populations.

Recommendations

1 More attention to the design of a regime-experiment in a prison setting.

The detention setting is not the easiest context to set up a controlled experiment. DJI and PI Nieuwegein have worked to make it possible to investigate the effects of an experimental regime. The research design of the regime-experiment as it took shape in practice, nevertheless had too many limitations to be able to draw firm conclusions. In a subsequent regime-experiment study, more attention needed for achieving a research design with repeated measurements and a sufficiently large number of participants, because otherwise there is a high risk that no clear conclusions can be drawn.

2 Attention to the level of stress among detainees and penitentiary institution workers and to the additional value of biological measures in signaling, prevention and intervention with regard to potentially harmful stress.

Stress is an important theme to pay attention to with respect to both detainees and correctional officers. For detainees it is inter alia about promoting security in detention by preventing stress-related behavioral problems and incidents. In addition reducing negative effects of stress on cognitive function can help improve the effectiveness of interventions in detention. An important subject for correctional officers is prevention of rising from work-related stress to harmful stress with the risks of psychological and physical problems and absenteeism.

In addition to tackling stress factors, the role of lifestyle factors in relation to stress also needs attention with respect to correctional officers and detainees. The present study provides indications that sleeping problems and overweight among correctional officers and/or detainees play a role in relation to stress, in addition to a beneficial effect of exercise. Lifestyle factors such as poor sleep, too much or unhealthy eating, too little physical activity, or excessive alcohol or drug use can be both a cause and a consequence of stress. Conversely, lifestyle factors such as a healthy diet and enough exercise and sleep can have a positive effect on how well people can deal with stress factors.
The scientific literature indicates that stress is best understood and intervened with from a biopsychosocial perspective. It is therefore worthwhile to use biological measures in addition to psychological factors such as self-reported stress, to detect harmful stress and in (preventive) interventions with regard to stress factors. Which biological measures are most suitable depends on the context. When it comes to the activity of the hormonal stress system over a longer period (as in this study), hair cortisol is suitable. If one wants to investigate the reaction of the stress system to certain events or after a short workout, salivary cortisol is suitable. Heart rate and skin conductance can also give a picture of the activity of the stress system over a shorter or longer period. Biological measures can for example be used to provide feedback to a participant in an emotion regulation training to better cope with experienced stress. Such training courses are already in use elsewhere and could be tested in the detention context. New technologies such as wearables that measure heart rate and skin resistance can probably be deployed in the near future.