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## Effect of Environmental Noise and Social Environment on Quality Life of Workers at Weaving Department

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### ABSTRACT

Noise exposure with high intensity on working environment during long time exposure could induce physic and psychologically disorder, giving feeling of uncomfortable and would affect stress and worker quality of life. In other side, social environment at working places that consist of social capital, family support, and good style of leadership psychologically giving feeling of comfortable and would reduce phsycological burden of workers. Aim of this study was to knew effect of environmental noise and social environment simultaneously toward quality life of workers. This study was conducted on workers of PT Kusumahadi Santosa, Karanganyar Regency, Central Java Province, Indonesia. Samples were 250 workers, selected by simple random sampling method. Exogenous variable consist of environmental noise, social capital, family support, leadership style, workers status and age. Endogenous variable on this study was quality of life. Data from all variables collected by using questionnaire and analyse with Path Analysis. Result of this study showed that environmental noise on weaving department affect quality of life by stress. Good social capital on working places affect quality of life of workers. Good works support affect quality life of workers.

**Keywords:** Noise, Social environment, Quality of life

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### INTRODUCTION

#### Background

Weaving is one of part of textile industry that commonly have highest intensity of noise such noise of textile industry on Karachi Pakistan were on 88.4-104 dBA<sup>(1)</sup>. Noise level on weaving department on Agung Saputra Textile were 99 dBA<sup>(2)</sup>. Noise on Textile Based Cottage Industries were 101.6 at lowest level and 109.8 dBA a highest level<sup>(3)</sup>. Noise on weaving department on PT Triangga Dewi Surakarta Central Java Province, Indonesia was 101.15 dBA on average<sup>(4)</sup>. Result of noise intensity on weaving department of PT Kusumahadi Santosa was 101.6 dBA on average with duration of exposure of each works during 48 hours on 6 workdays. Exposure of noise intensity and duration of exposure at company were exceed the cut off value that have been settled that was below 85 dBA and duration of exposure 40 hours a week (5 days).

Noise exposure on weaving department on textile industry was difficult to managed by company either technically or administratively. Noise exposure with high intensity and with long term of exposure will conduct physically and psychologically disorders on workers<sup>(5)</sup>. Physical disorder cause by noise were Hypertension and Tachycardi<sup>(6)</sup>, increasing of basal metabolism rate, vasoconstriction of small blood vessel especially on lower extremity, could made people become pale and having sensorineural disorder<sup>(7)</sup>. Physiological disorder cause by noise exposure with long term exposure were feeling of uncomfortable, disturbance of concentration, irritability, sleep disorder<sup>(8)</sup>. Noise could also make phsycological or mental disorder for workers<sup>(1),(9)</sup>. Workers who expose with noise on long time duration will get physical and phsycological disorder, noise as source of physical stress could make physiological changes, physiological changes could make change of behaviour. Noise could induce stress on workers<sup>(2)</sup>. Stress on long term period with high intensity could make indiviu become exhausted, even physically and mentally, this condition called with burnout, that is physical, mental and

emotional tiredness that induced by stress with long term period, on a situation that requires highly emotional engagement.

Workers on weaving department have a high risk for getting stress that induced by noise with high intensity in long time period. Indicator of stress that induced by noise exposure could be seen by physical and physiological changes of workers. Noise working environment could create feel of uncomfortable and will be responded as physiological and psychosocial changes of workers. Uncomfortable working environment and physiological and psychosocial changes of worker could affect assessment of worker quality of life. Quality of life is a workers perception toward physical and psychosocial condition, level of freedom of an individu to hold an activity, and interaction between him and his community<sup>(10)</sup>. Quality of life of an individu also affected by internal factor (physical environment: temperature, noise, social environment, and level of freedom) that will figure general health condition and wellbeing of an individu<sup>(11)</sup>.

Noise exposure with high intensity on workers at weaving department of textile industry and happened during long time exposure could induce highly stress of workers at weaving department<sup>(12)</sup>. High stress on workers at weaving department need to be reduced. Using hearing protection such as earmuff and earplug could reduce exposure less than 10 dBA, but the problem: workers were not used to wear it because it feel uncomfortable. Beside using of hearing protector to reduce exposure and reduce stress on workers, another approach to reduce stress on workers at weaving department was by social approach. Social approach toward workers by using consideration of working duration of workers (social environment on working places, 8 hours) and their family time (Social family environment). Both of these social environment (working places and in the family) were their daily most spent time. This consideration discuss on how perception of workers toward social environment on family (family support for workers) and social environment at working places (social capital) consist of role of leadership style of their supervisors.

Working places environment as social group where their members have the same goal and hope, interaction between member limited by rules, either formal or unformal rules, so that it will create social group. Interaction between members during activity using good social network and based on the norm. Sense of believing (trust) that limited by norm during interaction and social network as apart social capital component<sup>(13)</sup>. All of the aspect trust, norm, and social network were a unity of social capital component<sup>(14)</sup>. Social network facilitate communication process and interaction that build respect and collaboration. Inside a good social group it suggest to have strong social network, and strong social network will strengthened collaboration between it's members. Mutual trust between individu, togetherness, and solidarity were fundamental element on social capital<sup>(15)</sup>. Social capital bonding determine by individual networks that have similar passion and characteristics<sup>(16)</sup>. Supervisor was one of component of social environment at working places that empower and influence wokers to do their duties and responsibility as company expectation. Ability of supervisor to empower workers could affect psychological condition of workers.

Family as the smallest social environment have emotional bonding within family. Family support given to family members who face a problem including stress<sup>(17)</sup>. Family support seen by supportif act from family member, family characteristics (open and close), and what an individu feel when he got some support<sup>(18)</sup>. Good family support could be buffering effect and could strengthen individual and family mental health<sup>(19)</sup>. Workers as social creature on daily living was not free from another people when he met a problem such as working stress. Social support need to reduce or suppres working stress on the form of emotional, instrumental, and appreciation support and family support<sup>(20)</sup>.

Age of workers figure physical condition to do their duty and responsibility at working place, increasing of age followed by decrease of physical dan psychosocial ability to do their dailiy activity. Increasing of age followed by technical and psychosocial maturation that show his wisdom anda rationality, and emptional control<sup>21</sup>. Age also a factor that can induce stress. Older the age, it will be easier for people to get stress, it cause by decrease of physiological factor such visual, thinking, memory and listening.

## METHODS

It was an observational study, with crosssectional study design. This study conducted on workers at weaving 1, weaving 2, and administration department of PT Kusumahadi Sentosa in Karanganyar District, Central Java Indonesia from Mei to August 2015. Sample size were 250 workers, collected with proportional simple random sampling. Variable of this study consist of exogenous variable: environmental noise, social capital, family support, workers status, age and leadership style. Endogenous variable was quality of life. Data from all of variable collected by questionnaire. Instrument for collecting Data has been tested for validity and reliability for 30 respondent. Data from result of this study delivered by table and picture. Data were analyze by path analysis.

## RESULTS

Workers at weaving department was mostly a male 59.2%. Education status majority was Senior High School (66%). Most of workers have married (83.2%) and most of workers on weaving have working experience more than 29 years old, (29.6%). Respondent characteristics can be seen in the following table 1.

Table 1. Characteristics of workers based on: sex, educational level, age, marital status, and working experience

Subject characteristics	Frequency	Percentage
<b>Sex</b>		
Female	102	40.80
Male	148	59.20
Total	250	100.00
<b>Education</b>		
Elementary School	22	8.80
Junior High School	58	23.20
Senior High School	165	66.00
Higher Education	5	2.00
Total	250	100.00
<b>Marital Status</b>		
Not Married yet	37	14.80
Married	208	83.20
Widow/ widower	5	2.00
Total	250	100.00
<b>Working experience</b>		
1 to 8 years	58	23.20
9 to 15 years	10	4.00
16 to 22 years	19	7.60
23 to 29 years	89	35.60
>29 years	74	29.60
Total	250	100.00

Source: PT Kusumahadi Santosa in 2016

Result of workers toward noise at working places. Most of workers (70%) had perception that their working places was very noise, 30% other state oppositely. The distribution of employees based on the perception of environmental noise can be seen in table 2.

Table 2. Distribution of perception toward noise at working places

Environmental noise	Frequency	Percentage
Less noise	75	30.00
Very noise	175	70.00
Total	250	100.0

The results of research on social capital in the workplace showed that most workers (85.4%) gave a good social capital assessment at the workplace, while the less good (14.6%). The results of social capital assessment in the workplace can be showed in table 3 as follows:

Table 3. Distribution assessment of social capital at working places

Social capital	Frequency	Percentage
Good	214	85.40
Poor	36	14.60
Total	250	100.00

Table 4 showed that result of assessment toward family support on workers. Result show balance outcomes, 50.4 % family support was good and 49.6% other was poor.

Table 4. Distribution Frequency of Workers Based on Assessment of Family Support for Workers

Family support	Frequency	Percentage
Good	126	50.40
Poor	124	49.60
Total	250	100.00

Table 5 shows that workers age at weaving department, almost a half (48%) of workers had age 45 years old, meanwhile 52% other workers had age more than 45 years old. Average of workers age at weaving were 45 years old.

Table 5. Distribution of age

Age	Frequency	Percentage
< 45 years old	120	48.00
≥ 45 years old	130	52.00
Total	250	100.00

Table 6 shows that workers status at weaving, more than a half (60%) of workers had status as permanent workers, 40% others were non permanent (outsourcing) workers.

Table 6. Distribution of workers status

Workers status	Frequency	Percentage
Permanent	150	60.00
Non permanent (outsourcing)	100	40.00
Total	250	100.00

More than a half of workers (53.2%) assessment that their supervisors leadership style was democratic, meanwhile 48.6% other was authoritarian.

Table 7. Distribution of assessment toward supervisor’s leadership style

Leadership style	Frequency	Percentage
Authoritarian	117	46.80
Democratic	133	53.20
Total	250	100.00

Table 8 shows that assesment of quality of life for each workers. More than a half (60%) of workers gave good assessment of quality of life, meanwhile 40% others state that their quality of life were poor.

Table 8. Distribution of assessment of quality of life

Quality of life	Frequency	Percentage
Good	150	60.00
Poor	100	40.00
Total	250	100.00

Figure 1 shows the result of study delivered with path analysis using “Stata”.

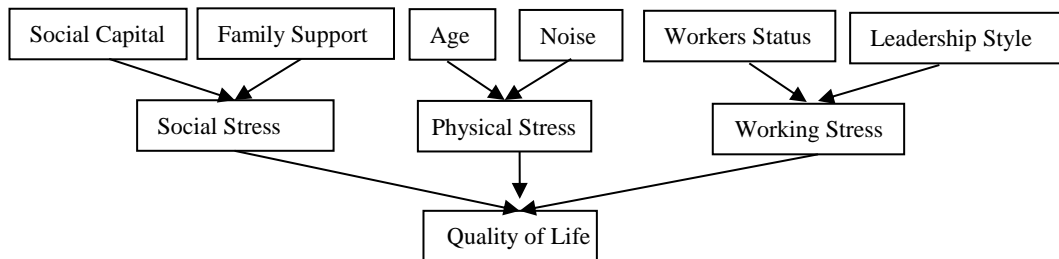


Figure 1. Model to keep quality of life at noise working places

From path analysis known that:

- Social capital undirectly affect toward quality of life by social stress. Working environment that have good social capital on average have logodd of social stres 0.8 point lower than working environment that have poor social capital. Workers who have high social stress on average have logodd quality of life 0.6 point lower than workers who have lower social stress.
- Family support undirectly affect toward quality of life by social stress. Workers that have good family support on average have logodd stressor 0.27 lower than workers who have poor family support. Workers who have high social stress on average have logodd quality of life 1.3 point lower than workers who have lower social stress
- Age of workers undirectly affect toward workers quality of life by physical stress. Workers who have age more than 45 years old on average have logood of physical stress 0.44 points lower than workers whose age less 45 years old. Workers whose have high physical stress on average have logodd quality of life 1.3 points lower than workers that have lower physical stress.
- Noise at working places undirectly affect toward quality of life by physical stress. Workers who said their working places was very noise on average have logodd of physical stress 3.7 points higher than workers whose

- working places was less noise. Workers who have high physical stress on average have logod quality of life 1.3 points lower than workers thah have lower physicial stress.
- e. Workers status undirectly affect toward quality of life by working stress. Workers who have status as permanent workers on average have logodd of physical stress 0.46 points higher than outsourcing workers. Workers who have higher working stress on average have logodd quality of life 1.1 points lower than workers that have lower working stress.
  - f. Leadership style undirectly affect toward quality of life by working stress. Democratic leadership style on average have logodd of physical stress 2.2 points higher than authoritarian leadership style. Workers who have higher working stress on average have logodd quality of life 1.1 points lower than workers that have lower working stress.

### DISCUSSION

Result from study showed that noise exposure at working places environment are source of stress for workers at weaving department and udirectly affect quality of life of workers. High intensity of noise with long term exposure could induce stress of workers<sup>(5)</sup>. Noise is vibrant energy that propagate and expose body by air medium will better responded either physically or phsycologically. Physiologically and psychologically changes that happened on worker will expressed on assessment of their quality of life. Noise environment with high intensity has made workers become feel uncomfortable on their working places. Interaction between workers and uncomfot environment because of noise would give poor perception of quality of life.

Social capital on this study was proven to decrease stress of workers at weaving department, it showed that workers at weaving department have high sense of believing based on the norm who they obey and respect. Sense of believing and respect between workers happened because growth sense of togetherness between workers growth and high sense of solidarity so that they would be element of social capital<sup>(15)</sup>. Interaction between workers that have been performed on long time period based on similarity of working goals and respect, without any competition to run their duty will create friendship that has strong bonding to gain social network. Strong interaction between workers was characteristic of good social capital<sup>(16)</sup>. Long working experience of workers at weaving department could figured out duration of interaction between workers to gain social bonding. Good social capital give advantage for individu to improve difussion of information and promote healthy life behaviour that give psychosocial support to reduce stress and increase mental health<sup>(22)</sup>.

Family support on this study have contribution to reduce stress of workers at weaving department. Family as smallest social environment for workers at weaving department has giving crucial role to give support toward family member that works. Support given by family has give feel of safety and comfort for every family member when they meet a problem<sup>(23)</sup>. Family support for family member who works have reduce stress of workers<sup>(23)</sup>. Family support could be: emotional, material, assessment, instrumental have give good psychological aspect for workers to maintain personality, fullfill psychological need, keeping and loving and also take and give support<sup>(24)</sup>. Love, sense of belonging and be a part of the society around him/her, has beeing owned of family members (workers)<sup>(25)</sup> so that giving endorsement or highly motivate to run their duty and responsibility even physical environment on working places not support adequately.

Democratic leadership style on this study was not appropriate to be implemented on working places that have high noise intensity. Communication as main consideration form supervisor to give influence for workers so they could follow his/her instruction. Working place condition that could not support it, will make communication between supervisor and workers was not running effectively, workers could not deliver their idea and suggestion for supervisor and vice versa. Democratic style for workers at weaving department is suggested to do outside the working places according to agreement between management and workers. Working style affected by perspective of relationship between human, psychology and contingency that emphasis quality of interaction between supervisor and workers.

Stress was inability of a person to face changes that happened even at internal or external environment. Stress on someone marked some physiological and psychological changes that could be experienced by every workers. Stress could giving stimulation toward changes and growth of stress could be postive and needed; but stress could make bad adaptability, physical disorders and inability to solve the proble. These changes would affect someone perception to appraise their quality of life.

### CONCLUSION

Social capital on working places and good family support could reduce stress on workers at weaving department caused by noise exposure with high intensity during long time period. Recommendation of this study are it need to keep and improve social capital and family support. Usage of hearing protection device need to be implemented and getting supervised routinely to decrease noise exposure at working places.

### REFERENCES

1. Ashraf HDY. The Influence of Organizational Culture and Work Environment on Job Satisfaction and Motivation and Performance of Supervisor at Three, Four and Five Star Hotel in Surabaya (Pengaruh Budaya

- Organisasi dan Lingkungan Kerja Terhadap Kepuasan dan Motivasi Kerja Serta Kinerja Supervisor Hotel Bintang Tiga, Empat dan Lima di Surabaya). Doctoral Thesis. Surabaya: Program Pasca Sarjana Universitas Airlangga; 2009.
2. Budiyanto TD. Relationship between Noise and Work Period on Occurrence of Working Stress on Workers in Weaving Section "Agung Saputra Tex" Piyungan, Bantul, Yogyakarta (Hubungan Kebisingan dan Masa Kerja Terhadap Terjadinya Stres Kerja pada Pekerja di Bagian Tenun "Agung Saputra Tex", Piyungan Bantul, Yogyakarta. Kesmas UAD. 2010;4(2):76-143.
  3. Abbasi AA. Industrial Noise Pollution and its Impacts on Workers in The Textile Based Cottage Industries: An Empirical Study. *Mehran University Research Journal of Engineering & Technology*. 2010;30(1).
  4. Nadhiroh MH. Relationship between Exposure to Noise and Working Stress on Workers in Weaving Section PT Triangga Dewi, Surakarta (Hubungan Paparan Kebisingan dengan Stres Kerja pada Tenaga Kerja di Bagian Weaving PT Triangga Dewi Surakarta. Thesis. Surakarta: Program Pasca Sarjana Universitas Sebelas Maret; 2011.
  5. Hartono. Cellular Immune Response of People Exposed to Noise of Airplanes, Around Adi Sumarmo Airport, Boyolali; Review of General Reaction Score, Cortisol, Number and Activity of Natural Killer Cell (NK) in Women (Respon Imun Seluler pada Penduduk yang Terpapar Bising Pesawat Udara di Sekitar Bandara Adi Sumarmo Boyolali, Kajian Tentang General Reaction Score, Kortisol, Jumlah dan Aktivitas Natural Killer Cell (NK) pada Wanita). Yogyakarta: Program Doktor Ilmu Kedokteran dan Kesehatan Fakultas Kedokteran Universitas Gadjah Mada Yogyakarta; 2010.
  6. Dyah S. Noise, Length of Stay, Blood Pressure, and Hearing Threshold at Umbulharjo Terminal Yogyakarta (Kebisingan, Lama Tinggal, Tekanan Darah, dan Nilai Ambang Pendengaran di Terminal Umbulharjo Yogyakarta). *Jurnal Kesehatan Masyarakat*. 2008;2(3):133-193.
  7. Gayathri KJAA, Sornara R. Physical and Cardiovascular Implication of Noise Pollution Prevalled in Thoothukudi The Industry City. *International Journal of Chem Tech Research CODEN (USA): IJCRG*. 2012; 4(3):1223-1228.
  8. Permatasari AY. Relationship between Noise Level and Psychological Disorder of Workers in Weaving Section at PT X Batang Jawa Tengah (Hubungan Tingkat Kebisingan dengan Gangguan Psikologis Pekerja di Bagian Weaving di PT X Batang Jawa Tengah). *Jurnal Kesehatan Masyarakat*. 2004;2(1).
  9. Peker AI, Altin A. Industrial Noise and its Effects on Humans. *Polish Journal of Environmental Studies*. 2005;14(6):721-726.
  10. WHO. WHO QL Measuring Quality of Life, Division of Mental Health and Prevention of Substance Abuse. Geneva: WHO;1999.
  11. Molar P. Some Aspects of The Measurement and Improvement of Quality of Life; 2009.
  12. Yulianto B, Murti B, Hartono, Masykuri M. The Social Capital Effect on the Employee's Quality of Life in Noisy Work Environment. *Dama International Journal of Researchers (DIJR)*. 2017;2(1):57-62.
  13. Ridell AM. Measurement of Two Social Competence Aspect In Middle Childhood. *Journal of Development Psychology*. 1997;33(05):824-833.
  14. Lawang, R. M. Z. Social Capital: in Sociologic Perspective (Kapital Sosial: Dalam Perspektif Sosiologik). Jakarta: FISIP UI Press; 2004.
  15. Hyyppa MT. Healthy Ties Social Capital, Population Health and Survival. New York: Springer+Bisnis Media; 2010.
  16. Coleman. *Foundation of Social Theory*. Cambriedge and London: Harvard University; 1990.
  17. Yusuf AH. Department of Community Health Sciences. Hamdard College of Medicine and Dentistry; 2009.
  18. Niven N. *Health Psychology (Psikologi Kesehatan)*. Jakarta: EGC; 2000.
  19. Rasmun. *Stress Coping and Adaptation (Stres Koping dan Adaptasi)*. Jakarta: Sagung Seto; 2004.
  20. Safarino EP. *Health Psycology: Healthy Psychology Biopsychosocial Interactions*. New York: John Willeyant; 2002.
  21. Krisdarlina. Relationship between Understanding of Hospital Accreditation and Characteristics with The Performance of Nurse Manager at Central Police Hospital Raden Said Sukanto Jakarta (Hubungan Pemahaman Akreditasi Rumah Sakit dan Karakteristik Dengan Kinerja Perawat Manager Rumah Sakit Kepolisian Pusat Raden Said Sukanto Jakarta). Thesis. Jakarta: Fakultas Ilmu Kesehatan Universitas Indonesia; 2009.
  22. Berkman, Kawachi. *Social Epidemiology*. Oxford University Press; 2014.
  23. Straus, Sayless. *Personnel Management (Manajemen Personalia)*. New Jersey: Prentice Hall; 2006.
  24. Friedman M. *Family Nursing Teaching Textbook: Research, Theory & Practice (Buku Ajar Keperawatan Keluarga: Riset, Teori & Praktik)*. Jakarta: EGC.
  25. Potter PA, Perry AG. *Fundamental of Nursing, Books 1 (Fundamental Keperawatan, Buku 1)*. Jakarta: Salemba Medika; 2009.